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The determinants of stock market performance in emerging economies: The case of Latin America and Asia Pacific

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Abstract

A phenomenal growth of emerging markets has not only attracted an enormous interest from international institutional and individual investors, but it has also proved that these markets cannot be treated in the same way as developed markets. This research is intended to identify the main determinants of the stock market performance in emerging economies of Latin America and Asia Pacific. The study has been motivated by the increasing importance of these equity markets on the international financial arena. The capital markets of emerging economies have not only become an important asset class for international investors, but also they have become a new and increasingly important source of foreign capital for these countries. This research examines a set of macroeconomic variables, including inflation, foreign exchange rates, market integration, the Institutional Investor's country ratings, the U.S interest rates and financial risk premiums, and their role in explaining the fluctuations in the total returns on the stock markets in six Latin American and four Asia Pacific countries. The results show that the Institutional Investor's country ratings and financial risk premium are the best determinants of the stock market performance in Latin American and Asian Pacific countries. The attempt to separate the financial and country risks has also been undertaken with the successful results in four out of ten countries. The further findings show that financial risk premiums are an important risk factor, which explains the stock market returns in seven out of ten countries and, moreover, financial risk premiums appear to be an aggregate risk factor, which can successfully replace five macroeconomic variables, and above that they contain incremental information, which successfully explain the variance in the stock market returns. The findings may have significant implications for international investors and national policymakers in the emerging markets. The findings highlight the significance of the country default risk in explaining the stock market performance in the Latin American and Asia Pacific economies.

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CHAPTER 1

Introduction

1.1 Introduction

This chapter provides an overall framework of the thesis. It begins with a brief discussion of the important issues, investors and researchers face in emerging markets and specifies the aim and objective of the research. A brief literature review is presented in order to highlight the key research questions, which will be addressed in the research. Particular attention is given to the relevance of the study, aim and objectives of the thesis and the contribution of the research to the existing knowledge. Research methodology and limitations of the study are also duly discussed and at the end of this chapter a diagram, which depicts the structure of the thesis, is presented.

1.2. General overview

Emerging markets[1] have been growing at a phenomenal speed for the last two decades. Their total market capitalisation grew from US$145 billion at the end of 1980 to US$6,000 billion in 2005, an increase of 4,138%. For some individual markets the growth was astonishingly remarkable: between 1980 and 1992 stock market capitalisation in Thailand rose by 4,731%, while in South Korea it rose by 3,829% during the same period (Patel, 1998; Mobius, 1994; Brodie-Smith, 2005). The stock market development was also accompanied by the sharp increase in the number of securities, traded on these stock markets. The rapid development of stock markets in developing countries was backed up by good prospects of economical growth in these countries.

A phenomenal growth of emerging markets has not only resulted in significant implications for corporate and individual investors, but it has also proved that these markets cannot be

[1] Emerging market is defined by World Bank as a country with low or lower/upper middle income based on the estimation of a country's gross national income (GNI). Economies are divided according 2004 GNI per capita, calculated using the World Bank Atlas method, as follows: low income - US$825 or less; lower middle income – US$826-US$3,255; upper middle income – US$3,256-US$10,065.

treated in the same way as developed markets. The growth and investment opportunities of emerging markets could not go unnoticed by the international investors community. Attracted by the phenomenal returns, international investors have poured huge amounts of capital into the emerging markets, and, to a large extent, contributed to their growth and in most cases the resulting bubbles. When the bubbles started to burst first in Latin America and then Asia, the realisation came that these markets are far more risky than it was expected before and the usual indicators were often misleading and more importantly not sufficient to measure risk in these countries. The valuation ratios proved not to be efficient in many instances and often hard to obtain in emerging markets, and international investors mostly relied on the country risk and broader economic fundamentals. And yet, the credit agencies were infamously failing to predict the financial crises.

It is well known that financial crises and country defaults have undermined the performance of equity markets in emerging economies of Latin America and East Asia, usually causing financial turmoil in the crisis-affected economies and seriously affecting local and foreign investors. Therefore, it is becoming increasingly important to understand and identify the risk factors that affect the stock markets performance in emerging economies and to recognise in time any destabilising forces in emerging markets, which cause financial instabilities and lead to country defaults and equity market crashes.

Although capital markets of emerging economics have become an important asset class for international investors, associated with high returns, high volatility and diversification benefits, they are, of course, far more important to these economics themselves. The reason is that emerging economies became more dependent on their stock markets as a new and increasingly important source of foreign capital. For example, in 1985 Mexico's stock market capitalisation was 0.71 per cent of its GDP and the foreign ownership was not significant and mainly restricted. In 1995 the stock market capitalisation rose to 21 per cent of GDP and the foreign investors hold about 19 per cent of the market (Bekaert, 1999). These facts support

the view that understanding the stock market behaviour in emerging economies is becoming more important for wider financial communities.

Thus, the main question, both for the investors and researchers, is to explain how emerging equity markets behave and what accounts for their sometimes difficult to predict behaviour. There is a general consensus that emerging markets behave differently from developed markets and there are an extensive number of factors, which account for these underlying differences. The importance of this research lies in understanding the general characteristics of emerging equity markets and the main determinants of their sometimes unprecedented behaviour.

1.3 Aim and objectives

Over the last 20 years the emerging markets have attracted enormous attention from foreign investors raising the questions of how different these markets are from the developed economies. The foreign investors are trying to understand what the main risk factors are, whether these markets are efficient and if not then what is driving the stock markets in these economies. Yet, it is also important to know whether there are any regional differences among emerging markets themselves.

Taking into consideration all these questions the overall aim of this thesis is to identify the main determinants of stock market performance in emerging economies and find what role they play in explaining the behaviour of the emerging stock markets. Setting the following objectives for the research will help to achieve this goal:

- To identify those general characteristics of the emerging markets which represent the underlying differences between emerging and developed economies, and highlight any regional differences among the emerging markets;

- To identify the main determinants of emerging equity market performance in the literature on emerging markets in order to compile a full list of risk factors which could have an effect on emerging economies' stock markets;
- To test a set of carefully chosen variables, which are believed to be important determinants of the stock market behaviour in emerging economies; to analyse the correlations among these variables and to eliminate the proxies in order to choose the best variables accounting for the most variance in the equity returns in emerging countries;
- To separate country and financial risk to see which of these risks affects the stock markets most.

The reason, why the country default risk is given a special attention, is because a country default, caused by a severe balance of payment disequilibrium, might lead to substantial currency devaluations, interest rates rises, default on foreign debt, currency controls (Clark and Lakshmi, 2005), thereby severely affecting the stock markets. Among the other determinants of stock market performance, considered in this research, are inflation, currency risk, market integration, the Institutional Investor's country ratings and the U.S interest rates.

1.4 Overview of the literature

The first part of the literature review in Chapter 2 is focused on identifying those general characteristics of emerging equity markets, which distinguish them from the established developed markets. Among these characteristics the following are the most common: high volatility (Bekaert and Harvey, 2003; Bekaert, 1999; Bekaert, Erb, Harvey and Viskanta, 1998, Aggawal, Inclan, and Leal, 2001, Santis and Imrohoroglu, 1997, Barry et al, 1998), low correlation with developed markets and among the emerging markets (Bekaert, Erb, Harvey and Viskanta, 1998; Harvey, 1995; Errunza, 1994; Bekaert and Harvey, 2003; Bekaert, 1999; Kassimatis and Spirou, 1999; Goetzmann and Jorion, 1999), weak relation to market

fundamentals (Hargis, Maloney, 1997), non-normality of the equity returns (Harvey, 1995a; Claessens, Dasgupta, and Glen, 1995).

The literature review also covers such characteristics as international portfolio diversification benefits citing both advocates (Cosset and Suret, 1995; Errunza, 1994, 1997; Divecha, Drach and Stefek, 1992; Keana, 1993) and opponents (Erb, Harvey and Viskanta, 1998; Bekaert, 1999) of the presence of significant diversification benefits. Efficiency and return predictability in emerging markets are also discussed highlighting the significant institutional differences between developed and developing countries, which impose difficulties on the traditional understanding of market efficiency in emerging markets (Gunduz and Hetemi-J, 2005, Harvey, 1995, Bekaert et al, 1997 and Keane, 2003).

Divecha, Drach and Stefek (1992) argue that emerging markets tend to be relatively uncorrelated among themselves and with developed markets, thus providing portfolio diversification benefits for international investors. They claim that "over the past five years, a global investor who put 20% in an emerging market index fund would have reduced overall annual portfolio risk from 18,3% to 17,5% while increasing annual return from 12.6% to 14.7%" (Divecha, Drach and Stefek , 1992, p.41).

Market liberalisation and market integration in emerging equity markets and their consequences are given special emphasis as they play a crucial role in the development of emerging stock markets. There are a considerable number of research papers (Bekaert and Harvey, 2002; Harvey, 1995; Kim and Singal, 1997; Basu, Kawakatsu and Morey, 2000) highlighting the impact of financial liberalisation on emerging markets. Bekaert and Harvey (2003) argue that there is a consensus view that liberalisation dramatically increases financial sector vulnerability and together with a weak banking sector might lead to financial crisis.

Contagion, defined as an abnormally high correlation between markets during a crisis period (Bekaert and Harvey, 2002), is also given attention. Interestingly, researchers are being more convinced that the Mexican crisis in 1994 was more a one-country crises, whereas the Asian economics were contagion-stricken during the Asian crisis in 1997 (Erb, Harvey and Viskanta, 1998). The inadequate and weak corporate governance as one of the general characteristics of emerging markets is discussed in Johnson et al (2000b), Denis and Connel (2002), Klapper and Love (2002) and Bekart and Harvey (2003).

The second part of the literature review in Chapter 3 is focused on main determinants of the performance of emerging stock markets including those like sovereign spreads (Gendreau and Heckman, 2003), country ratings (Erb et al, 1995, 1996b; Bekaert et al, 1997; Bekaert and Harvey, 2000a, Cantor and Packer, 1996a), valuation ratios (Campbell and Shiller, 1998; Fama and French, 1992; Maroney et al, 2004; Claessens et al, 1998; Groot and Verschoor, 2002), inflation rates (Erb et al, 1995; Hooker, 2004), population demographics (Bakshi and Chen, 1994; Bekaert et al, 1998), exchange rates (Bailey and Chung, 1995; Harvey, 1995) and others.

Although greater attention is given to other determinants of emerging equity markets, country risk is viewed as the main determinant of the stock market performance. The vulnerability of emerging markets to financial crises raises serious issues for foreign investors and the empirical evidence shows that financial crises have a drastic effect on the stock markets causing dramatic drops in stock market indices in emerging economies. Despite an increasing interest, most of the existing research papers focused on the emerging equity markets use a general concept of political or country risk as a main factor of increasing stock market volatility (Kim and Mei, 2001; Chan and Wei, 1996; Cutler et al, 1989; Bittlingmayer, 1988; Agmon and Findlay, 1982; Diamonte, Liew, and Stevens, 1996). There have been only few attempts to aggregate political risk in emerging markets into country default risk (Eaton and

Turnovsky, 1983; Karmann and Maltritz, 2002; Clark and Kassimatis, 2003) as a proxy of broader political risk.

1.5 Research methodology

In this research 10 emerging economies are considered. The sample includes six Latin American (Argentina, Brazil, Chile, Colombia, Mexico and Venezuela) and four Asian Pacific countries (Indonesia, Malaysia, Thailand and the Philippines). The period under consideration spans from 1985 to 2003.

The multivariate linear model is used to define the main determinants of the stock market returns among the following explanatory variables: financial risk premium, inflation, foreign exchange rates, market integration, the Institutional Investor's country ratings, GDP, the U.S. interest rates and foreign reserves to short-term debt (quick ratio).

To ensure external validity, two groups of countries with different characteristics will be used in the research. A thorough process of model specification will ensure the internal validity of the findings. At that stage the principal component analysis will be conducted to eliminate the redundant variables, and model selection criteria will help to choose a model with the best fit.

The calculation of the country default risk and financial risk premiums is mainly based on the contingent claims model, developed by Black and Cox (1976) and Merton (1974, 1977). Chapter 4 discusses the structural form of the contingent claims model, where default may occur at any time between issuance and maturity of the debt, when the value of the economy falls below the lower boundary (Black and Cox, 1976).

To calculate the value of economies, Clark's (1991a, b and 2002) model is followed, where the value of an economy is estimated as the USD value of a country's capacity to generate net exports. This value is calculated as analogous to the market value of a company's assets,

discounting the present value of the expected net cash flows, which, in the case of a country, will be the expected foreign exchange, generated by the economy to service the external debt. Clark and Lakshmi (2005) argue that this methodology proves to be useful in determining country creditworthiness and in forecasting sovereign debt defaults and rescheduling. The model is discussed in greater detail in Chapter 4.

Once the probabilities of country default and financial risk premiums are estimated, the regression analysis together with principal component analysis and model selection will be used to define the variables best explaining the fluctuations in the stock market returns in the sample countries.

The limitations of the study will depend on the model specification and data quality and availability. Thus, all these factors should be taken into careful consideration. Bekaert and Harvey (2003) argue that the main problem with the data in emerging markets is that equity returns are highly volatile and the time periods, for which data are available, are sometimes too short. There is also a potential problem of non-stationarity of most of the time series in emerging markets. The problem of non-stationarity will be given special attention and some solutions will be found to overcome this problem.

1.6 Main findings and contribution of the research to the existing knowledge

Abugri (2006) argues that there is still a wide gap in the empirical identification of macroeconomic variables affecting the stock market fluctuations in emerging economies. This research is one of the few comprehensive studies of the stock markets in the emerging economies, which looks at a wide set of macroeconomic variables and attempts to find an aggregate risk factor explaining most the variance in the stock market returns. It also attempts to separate country and financial risk in order to prove that financial risk premiums are capturing financial risks beyond the widely used country ratings.

This research examines a set of macroeconomic variables, including inflation, foreign exchange rates, market integration, the Institutional Investor's country ratings, the U.S interest rates and financial risk premiums, and their role in explaining the fluctuations in the total returns on the stock markets in six Latin American and four Asia Pacific countries.

As most of the explanatory variables are found to be non-stationary, the first differences are used in the first part of the empirical analysis in Chapter 5. The results show that the most important variables with the stationary time series are the U.S interest rates, inflation and market integration. Analysing the results in the countries, where these variables proved to be important, several conclusions might be drawn. It appears that the falling U.S. interest rates during the period under consideration are more indicative of increased capital inflows rather than decreased country default risk. Inflation appears to be a statistically significant variable in the countries with the lowest inflation rates (Malaysia, Thailand and Colombia), which also does not provide sufficient information about the risk factors affecting the stock markets in the emerging economies. Market integration is a significant variable in explaining the behaviour of the stock markets only in Colombia, Mexico and Indonesia. These results, although encouraging, do not fully answer the question of what market fundamentals and underlying risks affect the stock markets in emerging economies and further analysis is undertaken in the following chapters.

Although the results, obtained when using non-stationary time series, are valid within the time period under consideration (Gujarati, 2003), there are a few arguments to undertake this analysis. First of all, transforming the data (i.e. taking the first differences), might result in information loss and the original relationships between variables would be more difficult to detect. Secondly, a recent paper by Chanwit (2006) questions the stationarity of equity returns in emerging markets and argues that the majority of the stock returns in emerging markets can be more appropriately regarded as $I(1)$ or non-stationary. This view is also supported by the Augmented Engle-Granger cointegration tests, performed to test the

stationarity of the residuals, which showed that total returns and other non-stationary time-series are cointegrated.

After a careful examination of the relationships among all the variables, the use of the principal component analysis and model selection in Chapter 6, the results show a very strong evidence that financial risk premiums are superior explanatory variables in seven out of ten countries and can explain between 3% and 15% of the quarterly fluctuations and between 14% and 50% of the annual fluctuations in the stock markets in those countries. The means of the financial risk premiums in Latin America and Asia Pacific are statistically different, supporting the assumption that these two regions might have different risk profiles. The coefficients of the financial risk premium (FRP) are considerably higher in Asian countries in comparison to Latin American countries, indicating that the marginal increase in financial risk premiums in Asia results in considerably higher returns.

Chapter 7 shows that five macroeconomic variables can explain up to 94% of the variance in financial risk premiums. These results provide evidence that financial risk premiums can substitute a set of macroeconomic variables including inflation, currency risk, country ratings, market integration and the U.S. interest rates. It is very encouraging to find that in Argentina, Chile and the Philippines, the residuals of financial risk premiums, after regressing financial risk premiums on the set of macroeconomic variables, still contain information about the total returns on the stock markets. Moreover, the separation of financial and country risks in Chapter 8 proves to be successful and the 'pure' financial risk can explain the performance of stock markets in Argentina, Indonesia, the Philippines, and Thailand.

The findings may have significant implications for investors in their investment decision making and for national policymakers. The findings highlight the significance of the country default risk in explaining the stock market movements in the Latin American and Asia Pacific

economies. One of the important practical applications is the improvement of investors' portfolio performance and a better understanding of risk-return relationships in emerging markets. The results also support that the existence of differences in risk-return relationships in two regions.

The findings also give national policy makers a better understanding of the relationship between country default risk and its effect on the stock market performance. One of the important implications for national policy makers is the understanding that the fiscal and monetary health of the country has a great significance for the stock market. And importance of this is emphasized by the fact that stock markets have become one of the most important sources of capital in emerging economies. Another implication both for policy makers and investors is that the widely accepted and widely-used country fundamentals might not produce the best results when analysing the performance of the stock market.

1.7 Organisation of the thesis

This thesis provides an overview of the general characteristics of emerging equity markets in Chapter 2. Chapter 3 discusses the common determinants of the stock market performance in emerging markets and it particularly focuses on country default risk as one of the most important determinants of stock market performance. Chapter 4 gives an overview of the methodology of the thesis including credit risk modelling and evaluation of an economy's value. It discusses the structural form of the contingency claims model and Clark's (1991a, b and 2002) model of the estimation of economies' value. Chapter 5 summarises the results, obtained with stationary time-series, and examines the relationship between the variables. Chapter 6 examines the non-stationary time series and the results are discussed in greater detail in Chapter 7. The separation of the country and financial risks is attempted in Chapter 8. Finally Chapter 9 summarises all the salient findings.

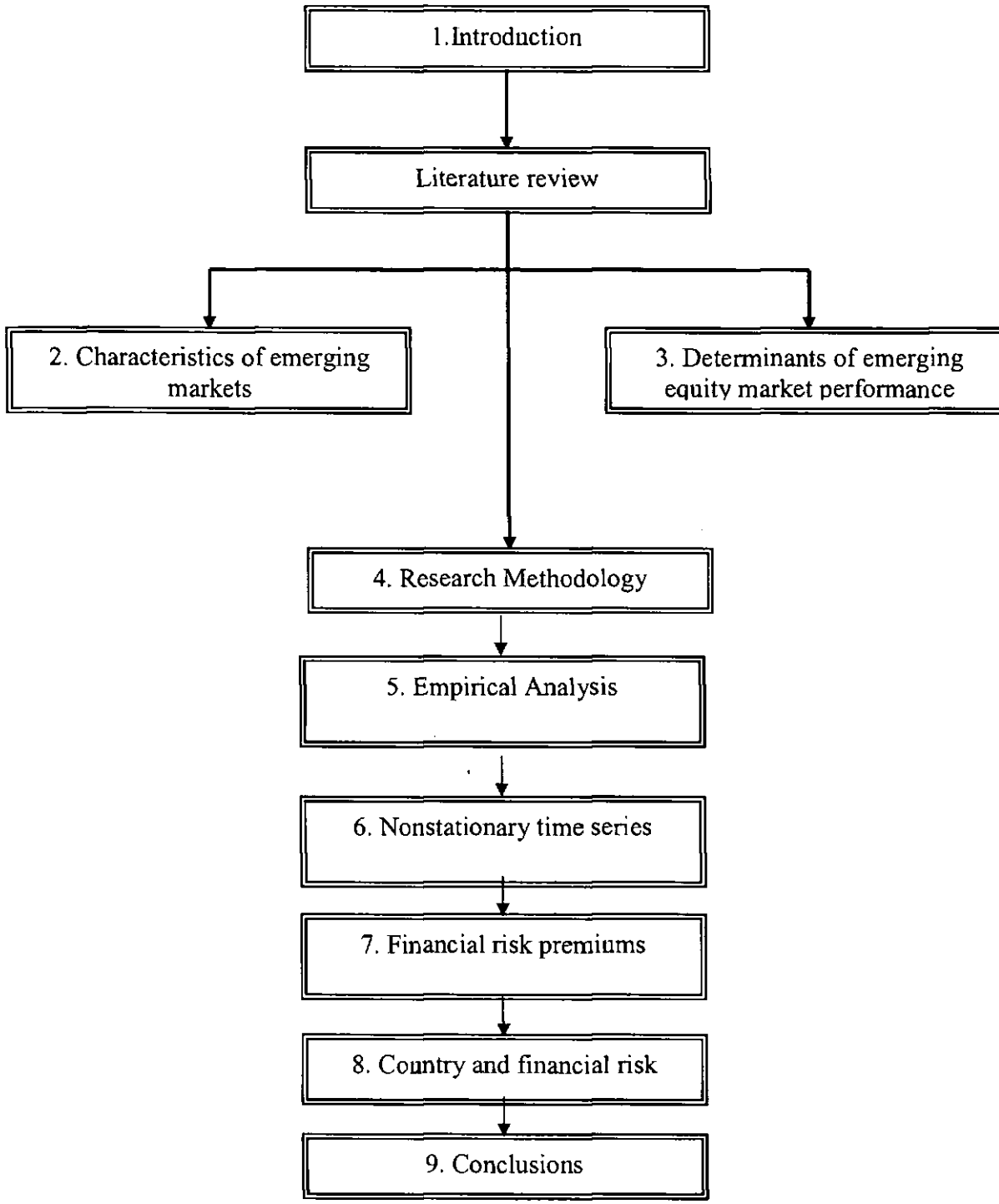


Figure 1. The structure of the thesis

CHAPTER 2

Literature Review Part 1

2.1 Introduction

Chapter 2 gives a broad overview of the characteristics of emerging equity markets. The understanding of the underlying differences between emerging and developed countries proves to be vital in investment decision-making and portfolio diversification strategies. Section 2.2 discusses general characteristics of emerging markets such as high volatility, non-normality of the equity returns, low correlation with developed markets and low correlation within the emerging markets. Section 2.3 focuses on international portfolio diversification benefits, which account for the phenomenal interest in emerging markets. Section 2.4 discusses non-normality of equity returns and Section 2.5 tackles the problem of efficiency in emerging markets. Section 2.6 gives a brief overview of contagion effects in countries, affected by financial crises and Section 2.7 discusses a problem of high volatility in emerging markets. Internal factors like corporate governance problems, which can also have an impact on stock market performance, are discussed in Section 2.8. Section 2.9 discusses in considerable detail the effect of financial liberalisation and market integration on emerging equity markets. The regional similarities and differences in financial flows to Latin America and Asia Pacific are discussed in Section 2.10. Section 2.11 summarises the chapter.

2.2 Characteristics of emerging equity markets

Emerging markets possess some general characteristics, which distinguish them from the established developed markets. Commonly emerging economies demonstrate a relatively high economic growth on average in comparison to developed markets. Among other economic attributes of emerging markets is high dependence on a particular industry or sector, which makes emerging economies vulnerable to adverse macroeconomic movements. Due to traditional dependence on a particular industry, developing economies usually

demonstrate poor or average level of industrialisation, and poorly developed infrastructure. In most developing countries the market structure is characterised by an oligopolistic and cartelised banking system (Cho, 1986).

Emerging markets[2] have been growing at the phenomenal speed for the last two decades. Their total market capitalisation grew from US$145 billion at the end of 1980 to US$6,000 billion in 2005 (Patel, 1998; Mobius, 1994; Brodie-Smith, 2005). For some individual markets the growth was astonishingly remarkable: between 1980 and 1992 stock market capitalisation in Thailand rose by 4,731%, while in South Korea it rose by 3,829% during the same period (Kassimatis and Spirou, 1999). The stock market development was also accompanied by the sharp increase in the number of securities, traded on these stock markets. The phenomenal development of stock markets in developing countries was backed up by good prospects of economical growth in these countries, reflected in GDP growth. For instance, the annual average growth of the East Asian countries in the period 1985-2003 was 5.1% and in Latin America 2.9%. In the OECD countries the annual average real GDP growth in the same period was 2.6%.

Divecha, Drach and Stefek (1992) define an emerging market as one, which has the following characteristics: securities, which are traded in a public market, high economic growth, being of interest to global institutional investors and having a reliable source of data. However, they are also characterised by high dependence on a particular industry or sector, poor or average level of industrialisation and poorly developed infrastructure.

The equity markets development in these countries can be seen as a result of market liberalisation policies, which led to the opening up of the markets, providing a wider access

[2] Emerging market is defined by World Bank as a country with low or lower/upper middle income based on the estimation of a country's gross national income (GNI). Economies are divided according 2004 GNI per capita, calculated using the World Bank Atlas method, as follows: low income - US$825 or less; lower middle income – US$826-US$3,255; upper middle income – US$3,256-US$10,065.

to international investors and hence to foreign capital. Another factor, which has contributed to the emerging markets development, is their increased attractiveness due to perceived potential benefits in international portfolio diversification by foreign investors. Both of these factors and more or less steady economical growth have contributed to the rapid development of the emerging equity markets.

However, during the past two decades emerging markets have also experienced several severe financial and economic shocks (the "Tequila Crisis" in Mexico in 1994, the "Asian flu" crisis in Southeast Asia in 1997, the "Russian virus" crisis in Russia in 1998, the crisis in Brazil in 2000 and Argentina in 2002), which have slowed down the economic growth in these countries, lowered average equity market returns, and increased market volatility (Bekaert, 1999).

A considerable number of researchers agree with the fact that the emerging stock markets possess specific characteristics, which are different from those of the developed markets (See Table 1, p.24). Among these characteristics the following are the most common: high volatility (Bekaert and Harvey, 2003; Bekaert, 1999; Bekaert, Erb, Harvey and Viskanta, 1998, Aggawal, Inclan, and Leal, 2001, Santis and Imrohoroglu, 1997, Barry et al, 1998), low correlation with developed markets and among the emerging markets (Bekaert, Erb, Harvey and Viskanta, 1998; Harvey, 1995; Errunza, 1994; Bekaert and Harvey, 2003; Bekaert, 1999; Kassimatis and Spirou, 1999; Goetzmann and Jorion, 1999), weak relation to market fundamentals (Hargis, Maloney, 1997), non-normality of the equity returns (Harvey, 1995a; Claessens, Dasgupta, and Glen, 1995).

Table I. Main characteristics of emerging markets

N	Characteristic	Researchers
1	High volatility	Santis and Imrohoroglu, 1997 Bekaert, Erb, Harvey and Viskanta, 1998 Barry et al, 1998 Bekaert, 1999 Aggawal, Inclan, and Leal, 2001 Bekaert and Harvey, 2003
2	Low correlation with developed markets and within the emerging markets	Errunza, 1994 Harvey, 1995 Bekaert, Erb, Harvey and Viskanta, 1998 Bekaert, 1999 Kassimatis and Spirou, 1999 Goetzmann and Jorion, 1999 Bekaert and Harvey, 2003
3	Non-normality of the equity returns	Harvey, 1995a Claessens, Dasgupta, and Glen, 1995 Bekaert, Erb, Harvey and Viskanta, 1998 Bekaert and Harvey, 2002

Hargis and Maloney (1997) point out that emerging markets are often highly concentrated and subject to speculative manipulation. This means that larger stocks, which make up a huge proportion of the overall market capitalisation, dominate these markets. Divecha, Drach and Stefek (1992) argue that because large stocks dominate the overall market return, there are not many opportunities for diversification. Their results also show some anomalities: for instance, Pakistan, Jordan, Colombia, Nigeria, and Zimbabwe display relatively low risk over the sample period, which mostly reflect the lack of liquidity in these markets rather than genuine volatilities.

Chuhan (1992) argues that one of the characteristics of emerging markets is poor liquidity, which stops foreign investors from investing in those markets. Using the zero return measure as a proxy for illiquidity, Bekaert, Harvey and Lundblad (2002e) found a strong association between higher illiquidity and higher expected returns. Although they did not find a great effect of liberalisation on the relation between illiquidity and expected returns, they argue that the effect of illiquidity on expected returns is larger in the post-liberalisation period.

Along with a small number of listed companies and market participants as the main characteristic of the emerging markets Hargis (2000) mentions the lack of developed local pension and mutual funds and the limited float of closely held companies. Hargis (2000) argue that a limited number of companies and market participants reduce the risk sharing opportunities and liquidity of the stock market, which inhibits its development. Another major problem in emerging countries, which is linked to a small number of market participants, is a shortage of savings relative to investment needs (Lessard, 1976; Bekaert and Harvey, 2002).

Divecha, Drach and Stefek (1992) find that stock returns in the emerging markets tend to be more homogeneous than in developed markets implying that "unlike the developed markets, which tend to have forces that affect diverse sectors of the economy differently, the emerging markets tend to have a strong market-related force that affects all stocks within a market, which accentuates its volatility" (p43).

Keane (1993) argues that the emerging equity markets are characterised by high total risk and low systematic risk. By contrast, Errunza (1994) describes emerging markets as possessing high domestic systematic risk. Nordal (2001) argues that a large part of the total risk in emerging markets is constituted by country risk or political risk, while Keana (1993) insists on the above average risk in emerging markets.

These and other characteristics of emerging markets will be discussed below in greater detail.

2.3 International portfolio diversification benefits

One of the reasons of the huge interest in emerging equity markets is the international portfolio diversifications benefit. This issue has been broadly discussed in the literature and has both advocates (Cosset and Suret, 1995; Errunza, 1994, 1997; Divecha, Drach and Stefek, 1992; Keana, 1993, DeFusco et al, 1996) and opponents of the presence of significant

diversification benefits (Erb, Harvey and Viskanta, 1998; Bekaert, 1999, Bekaert and Urias, 1996). Errunza (1994) argues that the reason that many studies have similar results in favour of diversification benefits is that most of them have used the International Financial Corporation database and hence similar time periods. Bekaert (1999) also argues that the IFC global indexes "may not always accurately reflect the costs of emerging market investments relative to developed markets, or the restrictions that affect such investments" (p.83, 1999).

Bekaert, Erb, Harvey and Viskanta (1998) argue that emerging markets are considered as a stand-alone asset class and, moreover, a strategic asset class (Bekaert, 1999) in global portfolio management. According to international portfolio management theory low correlation between assets in a portfolio results in the overall risk reduction and diversification benefits. A considerable number of researchers claim that emerging markets are weakly correlated with developed markets and also among themselves (Bekaert, Erb, Harvey and Viskanta, 1998; Harvey, 1995; Bekaert and Harvey, 2003; Bekaert, 1999; Kassimatis and Spirou, 1999; Errunza, 1994). For instance, Harvey (1995) tests low correlation of emerging markets with the developed markets adding emerging market assets to the international portfolio and finds that this addition significantly reduces the portfolio risk.

In comparison to 41 percent average cross-country correlation among 17 developed markets, reported in Harvey (1991) over the period 1970-1989, the average cross-country correlation of the emerging market returns is only 12 percent (Harvey, 1995). Harvey (1995) also reports that Brazil has a negative correlation with Argentina, Venezuela, and Mexico, and also India and Pakistan are negatively correlated (based on the IFC data). Moreover, such countries as Argentina, Colombia, Venezuela, India, Pakistan, Nigeria, and Zimbabwe have effectively zero average correlation with the developed countries. The overall average correlation between emerging markets and developed markets is only 14 percent (Harvey, 1995).

Although emerging markets are weakly correlated with the developed markets, Erb, Harvey and Viskanta (1998) argue that the emerging markets equity do not create a "natural" hedge for the global investor as the emerging markets do not outperform the developed markets, when the latter are in a bear phase. This casts doubt on the emerging markets' role in diversifying global portfolio risk. Using the mean-variance spanning tests Bekaert (1999) studies the rewards and risks of investing in emerging markets. He comes to the conclusion that the studies, which show significant diversification benefits for emerging market investments, ignore the high transaction costs, low liquidity, and investment constraints associated with emerging market investments (Bekaert, 1999/2000). This is also consistent with Keana's (1993) statement that emerging markets are subject to high transaction costs and thin market conditions. In addition, Bekaert and Urias (1996) argue that there are no significant diversification benefits from emerging market closed-end funds.

While the emerging markets do not outperform the developed markets in the short-term, Bekaert et al (1998) argue that these markets exhibit long-horizon returns. Bekaert (1999) argues that in the medium to long term emerging markets show higher average returns than developed markets. Excess return opportunities in emerging markets are also reported in Keana (1993). An opportunity to gain higher returns is explained by some researchers (Harvey, 1993) by high predictability of equity returns in emerging countries and inefficiency of those markets. High expected returns should be associated with large exposures to risk according to the asset pricing theory. However, Harvey (1995) finds that the exposures to the commonly used risks in emerging markets prove to be low, most likely because of the failure of the asset pricing model assumption of the complete integration of world capital markets.

Bekaert and Harvey (2002) discuss the capital asset pricing model in the conditions of segmented markets. They argue that the local expected return in a completely segmented market is a product of the local beta times the local market risk premium. And it is likely that local expected return will be high, given the high volatility of segmented emerging markets.

In the fully integrated capital markets, the expected return is a product of the beta with respect to the world market portfolio times the world risk premium, which results in lower expected returns. Bekaert and Harvey (2002) argue that the transition from a segmented to integrated market will increase prices and decrease expected returns. The market segmentation and liberalisation will be discussed in Section 2.9 and the role of βs in the predictability of stock market returns later in the thesis in Section 3.6.

2.4 Non-normality of returns

One of the most important characteristics of emerging markets is non-normality of returns. Many researchers (Harvey, 1995a, 1995; Claessens et al, 1995; Bekaert, 1998; Bekaert and Harvey, 2002) find that returns in emerging markets are not normally distributed and moreover they tend to show significant skewness and kurtosis.

Harvey (1995a) and Claessens, Dasgupta, and Glen (1995) reject normality of the returns for many emerging markets. Harvey (1995) shows that the null hypothesis of normality can be rejected in fourteen of the twenty emerging markets, supporting the statement that the returns in the emerging markets are not normally distributed. The study of the emerging markets by Bekaert, Erb, Harvey and Viskanta (1998) shows that seventeen of twenty countries had positive skewness in the returns, and nineteen of twenty countries had excess kurtosis over the April 1987-March 1997 period.

Bekaert, Erb, Harvey and Viskanta (1998) argue that it is not only significant skewness and kurtosis, that are present in the emerging market returns, but also the skewness and kurtosis change through time. The change in skewness and kurtosis is caused by dramatic changes in the characteristics of the asset returns when emerging markets move from a state of segmentation to a state of integration (Bekaert, Erb, Harvey and Viskanta, 1998). They argue that the integration process can induce positive skewness and kurtosis, when the marginal investor changes from local to foreign, causing price hikes. According to their view,

integration leads to stock market development with more companies listed on the stock market and hence a more diversified index, which in its turn may decrease skewness and kurtosis and bring returns to normality. By contrast, Bekaert and Harvey (2002) argue that stock returns are not normally distributed both before and after the market liberalisation. It means, that despite the impact of market liberalisation on expected returns and correlation, it does not change skewness and kurtosis of the emerging markets returns.

The non-normality of the returns in the emerging markets has several implications. First, standard distributional models cannot be applied as in most cases they assume normal distribution (Erb, Harvey and Viskanta, 1998). Skewness and kurtosis of the returns mean that alternative models for risk should be applied and standard tools of portfolio management should be adjusted to the non-normality of the returns. Interestingly, Bekaert, Erb, Harvey, and Viskanta (1998) show that non-normalities in returns are often associated with low credit ratings.

2.5 Efficiency of emerging markets

The problem of efficiency in emerging markets has been given great attention in the literature. Some researchers (Gunduz and Hetemi-J, 2005) point out significant institutional differences between developed and developing countries, which might conflict with the traditional understanding of market efficiency in emerging markets. For instance, Saatcioglu and Starks (1998) state that implications of information flows on the stock price/volume relation are different in emerging markets.

With a consensus that emerging markets have different institutional characteristics in comparison to developed markets, researchers are still arguing about the efficiency and predictability of the returns in the emerging markets. For instance, while some researchers (Harvey, 1995; Bekaert et al, 1997) are arguing that the amount of predictability found in emerging markets is greater than in developed markets, other researchers believe otherwise.

Bekaert et al (2001) argue that the sources of predictability in emerging markets can be time-varying risk exposures and/or time-varying risk premiums, and the predictability can be also induced by fundamental inefficiencies.

Describing market efficiency in terms of institutional infrastructure, costs of transacting, financial disclosure system and the market's pricing behaviour, Keane (1993) argues that it is possible for emerging markets to be inefficient in the first three instances, but to be efficient in its pricing behaviour. However, Keane (1993) warns that one should distinguish between believing that a market is efficient and behaving as if the market is efficient. As he argues further "there are sound reasons for believing that emerging markets are likely to be less efficient than established markets, the lack of empirical data gives more reason to treat them as efficient in the sense of adopting a passive investment approach to them" (Keane, 1993, p. 21)

According to the efficient market hypothesis the opening up of the emerging markets should lead to a more efficient stock market as the availability of information should increase and this information should be reflected in equity prices. However, a number of research papers (Urritia, 1995; Kawakatsu and Morey, 1999; Kim and Singal, 2000; Harvey, 1993; Claessens, Dasgupta and Glen; 1995; Chang, Lima and Tabak, 2004) show that the random walk hypothesis is rejected for the majority of emerging markets. Harvey (1993) and Claessens, Dasgupta and Glen (1995) also argue that stock returns do not follow a random walk in the emerging stock markets.

Furthermore, Bekaert and Harvey (2002) argue that the market efficiency theory is not applicable in emerging markets, as they do not behave as the developed markets. Emerging market equity returns have higher serial correlation than developed markets and this serial correlation is symptomatic because of infrequent trading and slow adjustment to current information (Harvey, 1995; Kawakatsu and Morey, 1999). Company-specific news have less

impact on emerging market returns than in developed markets mainly because of insider trading, which occurs well before news announcement. Bekaert and Harvey say that "while none of these findings 'prove' that these markets are inefficient, the preponderance of evidence suggests that these markets are relatively less informationally efficient than developed markets" (Bekaert and Harvey, 2002, p.11).

Kim and Singal (2000) test the random walk hypothesis in the emerging markets. They have found that there is a significant reduction in predictability of returns after the market liberalisation for Brazil, Colombia, and Mexico and only in the case of Pakistan predictability of returns increases. For the whole sample Kim and Singal (2000) have found that stock returns become less predictable over the longer periods, indicating that these markets are becoming more efficient after market opening. Kim and Singal (2000) argue that market efficiency will improve over time because of increased informational efficiency and more frequent trading. They say, "if markets are predictable and foreign investors are sophisticated, then foreign investors are likely to profit from the predictability of returns. As the foreign investors take advantage of market inefficiencies, those market inefficiencies will decrease and the prices will react more quickly to new information" (2000, p.45).

Basu, Kawakatsu and Morey (2000) examine the pattern of return autocorrelation and test the random walk hypothesis before and after financial liberalisation in 24 emerging markets and the random walk hypothesis is rejected for the whole sample. Although the random walk hypothesis is rejected in the study by Urrutia (1995), the results show the weak form of market efficiency in four Latin American emerging stock markets: Argentina, Brazil, Chile, and Mexico.

Using a number of tests Kawakatsu and Morey (1999) find no significant difference in the behaviour of emerging market prices before and after liberalisation. Most of the tests conducted by Kawakatsu and Morey (1999) have failed to reject the null hypothesis of a

random walk before and after the market opening. In their results (after controlling for the noise trading) ten out of thirteen countries show no change in the stock returns before and after the liberalisation and only Turkey of the remaining three shows that the market becomes more efficient after the opening up. The main conclusion made by Kawakatsu and Morey (1999) is that the stock markets in the sample countries have been already efficient prior to the liberalisation process.

Harvey (1995) argues that emerging market returns are more likely than developed countries to be influenced by local information rather than global information factors and prove to be more predictable than the developed market returns as the analysis of predictability of the returns shows. He shows that in emerging markets over 50% of the predictable variance can be explained by local information. Harvey (1995) argues that the reason that the local information has more influence on the emerging stock markets than the global information is the segmentation of the emerging markets from the developed markets.

Errunza and Losq (1985) argue that "loose disclosure requirements, thinness and discontinuity in trading and less developed nature of LDC (less developed countries) markets might lead one to expect a lower degree of efficiency" (p.574, 1985). However, they say that the smaller markets may be in fact more efficient, as information is disseminated quickly among few market makers who know each other. Overall, they come to the conclusion that developing markets are not as efficient as developed markets, but the former can be comparable to the smaller European markets (Errunza and Losq, 1985).

Chang, Lima and Tabak (2004) test the predictability of emerging stock market returns by testing the random walk hypothesis (RWH) using a multivariate version of the variance ratio (VR) test with a heteroscedastic robust bootstrap procedure and by testing 1557 different trading rules. Their sample includes Latin American countries (Argentina, Brazil, Chile and Mexico) and Asian countries (India, Indonesia, Korea, Malaysia, the Philippines, Thailand

and Taiwan). Their results show that emerging equity markets indices do not resemble a random walk and there is predictability in emerging equity returns. They argue that after taking into account transaction costs trading rules do not generate statistically significant profits, which is also true when comparing a buy and hold strategy.

Claessens, Dasgupta and Glen (1995) tested the behaviour of stock returns in twenty emerging stock markets for return anomalies and predictability. They found limited evidence of turn-of-the-tax-year effects, size and seasonal effects, but they found significant evidence of predictability of returns. However, they could not identify whether this predictability was caused by market inefficiencies or any other factors like time-varying risk premiums or regime switching.

Lee (1992) finds evidence of strong seasonality in Asian emerging markets, for example, the 'January effect' in Taiwan and Singapore, significantly positive returns in December and negative in January in Korea, and significantly positive January and December returns in Hong Kong. However, this seasonality evidence is not consistent with the 'tax-loss-selling' hypothesis as in most of these East Asian countries there are no capital gains taxes. Lee, Pettit and Swankoski (1990) find day-of-the-week effects in Hong Kong, Korea, and Singapore.

2.6 Contagion

After the financial crises, which struck East Asia and Latin America in the last decade, contagion in financial markets has become a "catchy" word among investors, market makers and researchers. Exposure to contagion during financial crises has been defined as one of the main characteristics of the emerging markets, which can affect stock market returns, interest rates, the exchange rate or a combination of them. The phenomenon has been given a great deal of attention underlying its importance in understanding the nature of emerging markets.

Contagion refers to the abnormally high correlation between markets during a crises period as Bekaert and Harvey (2002) define it, leaving the definition of the abnormality open. Bekaert and Harvey (2002) try to define contagion in terms of correlation over and above the benchmark and find that there is substantial evidence of contagion during the Asian crisis in 1997, but they do not find any evidence supporting contagion in the Mexican crisis in 1994. Calvo and Mendoza (1999) argue that contagion can be explained by a herding effect among investors as they measure the performance of the stock markets against widely used benchmarks.

Erb, Harvey and Viskanta (1998) raised doubts about contagion effect in emerging markets and warn that one should be careful in drawing generalisations about contagion and applying them in different regional crises. They argue that "the Mexican crisis was more a one-country crisis and the Asian crisis involved multiple countries with similar problems" (Erb, Harvey, Viskanta, 1998, p.53). The conclusion, which can be drawn from this paper, is that careful consideration should be given to the interpretation of results of the cross-sectional analysis in countries, stricken by financial crises.

Edwards and Susmel (2001) find strong evidence of volatility dependence among several Latin American countries (namely Argentina, Brazil, Chile and Mexico), supporting the fact of interdependence more rather than contagion. The correlation coefficients, except for Mexico, do not show typical behaviour under the contagion hypothesis.

Forbes and Rigibon (2002) argue that there was no increase in unconditional correlation coefficients (i.e. no contagion) during the Asian crisis in 1997 and Mexican devaluation in 1994, although there is a high level of market co-movements, which is referred to as interdependence (i.e. strong linkages between the economies).

Yang and Lim (2004) study the 1997 financial crisis in East Asia and conclude that there are only short-term correlations among East Asian stock markets and shocks or impacts of innovations to a market are very short-lived (often as little as two days). However, they find a substantial increase of the interdependence after the 1997 crisis and, hence, confirm the presence of contagion effect in the region. They also argue that crises do not spread randomly, but often related to fundamentals. Kaminsky and Schmukler (2001) argue that rating agencies may contribute to cross-country financial turbulence spill-over as they tend to downgrade the neighbouring countries as well.

2.7 Volatility

There is a general consensus over high volatility in emerging markets, supported by numerous empirical studies. Santis and Imrohoroglu (1997) characterise emerging markets as markets with high conditional volatility and high conditional probability of large price changes in contrast to developed markets. Moreover, they find significant evidence of time-variation in volatility as well as support that periods of high/low volatility tend to cluster; volatility shows high persistence and is predictable.

Edwards and Susmel (2001) argue that volatility of emerging equity markets is primarily caused by the capital mobility with volatile capital flows undermining the financial stability. They even recommend emerging countries to implement policies and controls on capital in- and outflows to reduce their impact on the financial stability of a country.

Aggaval, Inclan, and Leal (2001) argue that the emerging markets are characterised by high volatility with frequent and sudden changes in variance. They use an iterated cumulative sums of squares (ICSS) algorithm to detect sudden changes in the variance of returns in emerging markets and the duration of these periods. They found that the periods with high volatility are being caused by domestic important events rather than world events. The only global event, which significantly affected emerging markets, is the October 1987 crash

(Aggaval, Inclan, and Leal, 2001). The fact of little impact of world factors on variance of returns in emerging markets is supported by Aggaval, Inclan, and Leal (2001), Bekaert and Harvey (1997a), Susmel (1997). According to Bekaert and Harvey (1997) global shocks are accounting only for less than 10% in volatility in sixteen of twenty countries. However, some researchers argue that market integration and liberalisation will lead to a greater effect of world events on domestic stock volatility over time once the market is open (Bekaert and Harvey, 1995, 1997; Hargis, 2002).

According to Kim and Singal's (2003) analysis, based on ARCH and GARCH models, the volatility of capital flows after market liberalisation, caused by frequent reactions (or overreactions) to short-term economic and political changes in developing countries, may increase the volatility of stock market. This is a problem of so-called hot money, when the international flow of funds is highly sensitive to fluctuations in exchange and interest rates, expectations of future economic growth or any significant changes in the investment climate in general. Kim and Singal (2000) argue that even a small shock in the economic environment can cause significant changes in flows of capital resulting in increased volatility and destabilisation of the domestic economy.

Hargis (2002) argues that greater foreign ownership may affect stock market volatility in two ways either increasing or decreasing it. Market liberalisation will decrease volatility if it leads to improved liquidity and reduced sensitivity of prices to large capital movements in the market (Hargis and Ramanlal, 1998). Hargis (2002) argues that volatility can increase because of greater information flows to the market. While Bekaert and Harvey (1997) and Holmes and Wong (2001) find evidence that volatility decreases in emerging equity markets after liberalisation, Bekaert and Harvey (2000), De Santis and Imrohoroglu (1997), Kim and Singal (2000), and Susmel (1997) do not find support that market liberalisation causes price volatility increase. Kim and Singal (2000) suppose that these differences in results can be

explained by differences in sample countries and differences in the method of aggregation in the studies.

Hargis (2002) studies four Latin American and four Asian stock markets over the period from January 1989 to November 1994. He finds a significant decline in volatility in Latin American markets following different forms of market liberalisation and he does not find any evidence of significant increase in volatility in Asian markets. He also finds that increased volatility is caused mainly by domestic factors in Latin America, except for Mexico, where after liberalization the transmission of volatility from the United States is registered (Hargis, 2002).

Kim and Singal (2000) show that Argentina and India experienced high volatility around the market opening. Mexico had a short period of high volatility prior to market liberalisation, while Colombia has a period of high volatility after market opening. However, some countries like Greece and Pakistan had long period of high volatility after market liberalisation. These results support the view that market opening does not necessarily increase stock market volatility in emerging markets.

Bekaert and Harvey (2002) argue that market integration does not lead to increased volatility and there is no empirical evidence of significant changes in volatility in the integration process from a segmented to an integrated capital market. According to their analysis of the average annualised standard deviation in twenty emerging markets, there is no obvious pattern in changes in volatility. There are some countries with a dramatic decrease in volatility in Argentina and Portugal. Among the rest of the sample, eight countries experience decrease in volatility and volatility has increased in ten (Bekaert and Harvey, 2002). However, controlling for other factors such as economic policies a number of researchers agree that capital market liberalisation do not significantly impact volatility (Bekaert and

Harvey, 1997, 2000a; Richards, 1996; Kim and Singal, 2000; De Santis and Imrohoroglu, 1997; Aggawal et al, 1999).

Khambata (2000) argues that emerging markets have been always volatile and that the presence of foreign investors may have reduced rather than increased the volatility. He argues that with opening up a market the risk will be spread more widely, which in turn will reduce, but not increase, the volatility of returns.

Edwards and Susmel (2001) study weekly stock market volatility in several Latin American countries using univariate and bivariate switching volatility models. Their results show that high-volatility episodes are usually short-lived, lasting from 2 to 12 weeks and the periods of high volatility tend to coincide with the occurrence of international financial crises. They also find that Hong Kong, when taken as a representative of the Asian market, shows no volatility dependence with the Latin American market.

Summarising this empirical results it can be noted that the volatility of returns in emerging markets is first of all affected by domestic significant events rather than global event. Another serious problem for emerging markets is a problem of so-called hot money, which can cause significant changes in flows of capital resulting in increased volatility and destabilisation of the domestic economy. Moreover, there is still no consensus among the researchers about the effect of market liberalisation on volatility of returns.

2.8 Corporate finance

Emerging equity markets are affected not only by external factors, but also internal factors, for example, corporate finance problems. A number of researchers (Johnson et al., 2000b; Denis and Connel, 2002; Klapper and Love, 2002; Bekaert and Harvey, 2003; Claessen, Djankov and Lang, 2000) show that corporate governance in emerging markets has been inadequate and weak during the 1990s resulting in the increased cost of equity capital and

difficulties to attract equity investment. Claessen, Djankov and Lang (2000) also point out poor performance and risky financing structures of East Asian corporations before the crisis. Bekaert and Harvey (2003) citing La Porta et al (1998) argue that there has been a huge gap in legal protection of shareholder rights in emerging markets and the use of corporate takeover mechanisms has been at an embryonic stage. The same view is expressed by Claessens and Fan (2002). They argue that weak corporate governance mechanisms are an obstacle in mitigating the agency problems. Although many firms use other mechanisms, for instance, employing reputable auditors, their effectiveness remains limited. Therefore, low firm value in emerging market is believed to have been directly associated with the weak and unhealthy management and misbalance of management ownership and control. Claessens and Fan (2002) argue that "resulting forms of crony capitalism, i.e. combinations of weak corporate governance and government interference, not only lead to poor performance and risky financing patterns, but also are conductive to macroeconomic crises" (p.73).

Citing a number of researchers (Nenova, in press; Lins, 2003) Bekaert and Harvey (2003) argue that "a great number of firms in emerging markets have mangers who possess control rights that exceed their cash flow rights in the firm, which, fundamentally, gives rise to potentially extreme managerial agency problems" (p.36, 2003). The problem is partially attributed to pyramid structures of a large number of firms in emerging markets (Shliefer and Vishny, 1997; La Porta et al, 1998, 1999; Claessens et al, 2000; Lins, 2003; Lemmon and Lins, 2003). Claessens and Fan (2002) argue that agency problems, including disproportion of control rights, are anticipated and priced by investors.

Lemmon and Lins (2003) use a sample of 800 firms in eight East Asian emerging markets to study the effect of ownership structure on value during Asian financial crisis in 1997. They show that during the crisis period the stock returns of firms, in which managers have high levels of control rights, which exceed their cash flow rights, are 10-20 percent below those of

other firms. Johnson et al. (2000a) show that countries with lower quality corporate governance were hit harder during the Asian crisis.

Harvey and Roper (1999) argue that corporate managers in East Asian countries have been trying to offset declining profitability with increasing amounts of borrowing in foreign currency in the years preceding the Asian crisis in 1997. Obviously, those companies have been hit very hard when the local currency dramatically depreciated and they were not able to generate enough cash to meet their foreign debt obligations.

Claessens, Djankov and Lang (2000) study corporate performance and financial structures of 5,550 companies in nine East Asian countries (Hong Kong, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand) over the period 1988-1996. Measuring profitability by real return on assets (ROA) in local currency, they find that profitability was relatively low in Hong Kong, Japan, Korea and Singapore over that period, while corporations in Indonesia, the Philippines and Thailand were showing high returns.

Claessens and Fan (2002) argue that the extent of ownership concentration including cross-shareholding and pyramid structures varies across East Asian countries. For instance, it is common in Korea and Taiwan, but less common in Thailand, where only 20% of controlling shareholders are involved in these practices. Whereas in Singapore a significant number of listed companies are controlled by the government. They also mention that control by financial institutions is less common in Asian economies and individual and institutional investors are commonly only minority shareholders.

Shleifer and Vishny (1997) and La Porta et al (1999) suggest that concentrated ownership is largely beneficial in less developed countries with poor property right protection, weak judicial systems and corruption. In addition, Yeh et al. (2001) find support that "family-controlled firms with high levels of control have lower financial performance than family-

controlled firms with low level of control and firms that are widely held (Claessens and Fan, 2002, p.78)."

Claessens and Fan (2002) argue that investors are aware of potential agency issues arising from ownership structure and discount equity prices accordingly. They find evidence that stock markets increase the cost of capital for firms with greater corporate governance issues. The problem of corporate governance in emerging markets is attracting increasing interest of researchers, especially in East Asia. However, the low transparency of business activities in these countries still remains the main obstacle to conducting research.

2.9 Financial liberalisation and market integration

Financial liberalisation plays a significant role in the development of emerging equity markets. However, there are controversial views about positive and negative impact of financial liberalisation on the economic growth of the developing countries. There are a considerable number of research papers highlighting the impact of financial liberalisation on emerging markets. Bekaert and Harvey (2003) argue that there is a consensus view that liberalisation dramatically increases financial sector vulnerability, which combined with a weak banking sector, might lead to financial crisis.

Bekaert and Harvey (2002) warn that it is necessary to distinguish between market liberalisation and market integration. The reason is that market liberalisation does not necessary lead to market integration (for instance, liberalisation might not be effective in attracting foreign investors) or markets can be integrated well before the official liberalisation (for instance, when foreign investors have access to the capital market through other means like country fund and depository receipts). They define market liberalisation as a removal of barriers and restrictions, which allows foreign investors to purchase or sell domestic securities and domestic investors to purchase or sell foreign securities. On the other hand, markets are considered integrated when assets of identical risk command the same expected

return irrespective of their domicile (Bekaert and Harvey, 2003). According to Harvey (1995), the factors, which contribute to the degree of integration are taxes, investment restrictions, the availability and accuracy of accounting information, the number of domestic securities cross-listed on developed exchanges, market liquidity, political risk and institutional protection of investors.

Theoretically, market liberalisation should lead to market integration of emerging markets with developed markets. It will encourage foreign capital inflow, bidding up the prices of the local equities. However, a number of researchers argue that initial overflow of capital will level out during three years after the liberalisation starting date (Bekaert et al, 2002a; Stulz, 1999; Griffin et al, 2002). Furthermore, theoretically market liberalisation should reduce the cost of equity capital and hence increase investment opportunities. Market liberalisation, accompanied by market integration, might lower expected returns as it will lead to increased correlation between emerging and developed markets. These are the theoretical consequences of market liberalisation for emerging market performance. However, controversial results are often obtained in the empirical studies.

First of all, the major challenge in the analysis of the impact of market liberalisation is to identify dates of liberalisation process, as they induce a structural break in the capital market data in emerging countries. Different researchers use different approaches to date market liberalisation process in emerging markets (Bekaert and Harvey, 2003; Kim and Singal, 1997; Kawakatsu and Morrey, 1999). Bekaert and Harvey (2002) name four main approaches to date integration of emerging markets with the world capital markets: event association, inference from the behaviour of financial assets and inference from the behaviour of key economic aggregates and market infrastructure. However, market integration is often a gradual process and its success depends on particular conditions in each individual country (Bekaert and Harvey, 2002). Bekaert (1995) identifies three main categories of barriers to emerging capital markets, which are to be removed during the market integration. There are

legal barriers, indirect barriers that arise because of information asymmetry, accounting standards and investor protection and risks that are especially important in emerging markets such as liquidity risk, political risk, economic policy risk and currency risk.

Bekaert and Harvey (2003) use three alternative ways in measuring capital market liberalisation: official regulatory liberalisation (for instance removal of foreign investment barriers to investing in some or all classes of shares in the domestic stock market), the earliest date of either an ADR (American Depository Receipts[3]) issue, closed-end country fund[4] launch, or an official liberalisation date, and the data denoting a structural break in capital flows. There are also other approaches to date the liberalisation process and sometimes there is no consensus over liberalisation dates for specific countries. Official liberalisation dates across emerging markets are presented in Henry (2000), Bekaert and Harvey (2000), Kim and Singal (2000) and Buckberg (1995).

Theoretically market integration should decrease the expected returns. The analysis of 20 emerging markets in Bekaert and Harvey (2002) support the theory showing a sharp drop in average market returns across these countries. In their analysis of the excess dollar returns across emerging markets Kim and Singal (2000) show that the returns are higher soon after liberalisation in eight out of twenty developing countries (namely, Brazil, Colombia, Greece, Pakistan, the Philippines, Turkey, Venezuela, and Zimbabwe), but they tend to decrease subsequently some time after the market opening. In the rest of the countries financial liberalisation did not significantly affect market returns. Santis and Imrohoroglu 3(1997) find that investors are not rewarded with higher expected returns being exposed to high country-specific risk. Only assuming some degree of market integration, they find that systematic risk is priced in Latin America but not in Asia.

[3] American Depository Receipts are rights to foreign shares that trade in dollars on a U.S. exchange or over-the-counter. (Bekaert and Harvey, 2000, p.570)

[4] A close-end country fund is an investment company that invests in a portfolio of assets in a foreign country (for instance, an emerging market) and issues a fixed number of shares domestically (for instance, in the United States) (Bekaert and Harvey, 2000, p.569)

One of the outcomes of market liberalisation is increased correlations with the developed markets resulting in a reduction of diversification benefits. For example, according to Hargis (2002) with introduction of American Depository Receipts in Chile and with greater foreign ownership in Thailand the diversification benefits in these markets have been reduced. On the other hand, Bekaert and Harvey (2002) argue that theoretically market integration does not necessarily lead to higher correlation with the world capital market. They support this view by saying that "a country with an industrial structure much different than the world's average structure might have little or no correlation with world equity returns after liberalisation" (p.6, 2002). However, the empirical evidence shows that correlations increase on average (seventeen of twenty markets show increased correlation with the MSCI World market return) and correlation among emerging markets have also increased.

Another consequence of market liberalisation is the decrease of the cost of capital. Bekaert and Harvey (2000a) have studied the equity return-generating process in twenty emerging markets and show that lower expected returns associated with market integration will result in a decrease of the cost of capital. Urias (1994), Tandon (1997) and Errunza, Senbet and Hogan (1998) argue that the introduction of country funds and ADRs theoretically leads to a price increase of domestic companies and reduces the cost of capital. Lower cost of capital theoretically should lead to the increase in investments as more projects will have positive net present value (Bekaert and Harvey, 2000a; Henry, 2000b). Kim and Singal (2000) also show that with market liberalisation the expected returns decrease and domestic firms have access to low cost of capital.

However, there is another view, which states that financial liberalisation may cause a significant deviation of stock prices from their fundamental values (Calvo and Mendoza, 2000; Kodres and Pitsker, 1998). They argue that following market liberalisation contagion and herding behaviour have led to a persistent deviation of equity prices from fundamentals in emerging markets.

To summarise, there are few issues concerning the effect of market liberalisation and integration on stock market performance in emerging countries. First of all, one should distinguish between market liberalisation and market integration as they refer to different states of emerging market openness. Secondly, a great challenge for emerging markets research is dating of the libcralisation process. Thirdly, there are certain consequences of market liberalisation such as increased correlation with the developed markets and as a result decrease of expected returns, decrease of the cost of capital and deviation of stock prices from their fundamental values.

2.10 An overview of the Latin American and Asian countries: Similarities and regional differences

During the 1970s many developing countries experienced increasing volumes of financial flows, mainly due to their attempt to liberalise their economies and relax foreign exchange restrictions. The financial meltdown of the world markets in the 1980s severely cut this financing, particularly hitting the Latin American countries. But it might not have been the main factor pushing developing countries into a series of financial crises and turmoil. Rather it might be due to the fact that the financial vulnerability was home-grown and was due to the unsustainability and inherent weakness of the financial and banking systems in these countries. Particularly the financial systems in East Asian countries were immature and poorly regulated given the dimension of the financial boom they were experiencing. Latin America started to receive fresh supply of funds only in the 1990s and had accumulated debt even larger than prior to the 1992 crisis. But these financial flows were very volatile, affected by the 'tequila' crisis in 1994 and the growing risk aversion as a result of the Asian crisis in 1997. Also the creditors were mostly anonymous bondholders rather than banks and therefore coordinated creditor response in case of financial crisis was almost impossible (Bulmer-Thomas, 2003).

In 1992 five Latin American countries (Argentina, Venezuela, Brazil, Chile and Mexico) received around 55 percent of all portfolio flows to developing countries, and 28 percent of these capital flows were received by six East Asian countries (Indonesia, Korea, Malaysia, Thailand, the Philippines and China) (Chuhan et al, 1998). However, the composition of financial flows in the early 1990 in Latin America and East Asia was substantially different. East Asia was receiving large amounts of foreign direct investments with comparatively small part of short-term capital inflows, while in Latin America capital inflows were mostly short-term and FDIs were scarce due to Latin America's poor track record and low growth (Kaminsky and Reinhart, 1998). Only few countries in Latin America, notably Chile, adopted restrictions on short-term capital inflows, while others were too happy and careless to take anything what was available (Bulmer-Thomas, 2003). But these differences had disappeared by 1996 as the East Asian countries started to speculate on short-term capital inflows and foreign investors were returning to Latin America after the implementation of major inflation-stabilisation programmes.

Another major difference between the Latin American and Asian Pacific countries is that while the Asian Pacific countries were receiving capital incentive in the government-led export promotion programmes, the Latin American countries were oriented on import-substitution industrialisation.

Kaminsky and Reinhart (1998) compare Latin American and East Asian countries on the eve of crises examining 15 economic indicators, which capture overlending cycles and other financial factors. They find significant difference in volatility of the capital account and financial sector between 1970 and 1990, but witness these differences eroding throughout the 1990s. Kaminsky and Reinhart (1998) argue that Latin American countries suffered 50% more crises per country than the East Asian countries in the period between 1970 and 1995.

Kaminsky and Reinhart (1998) write: "Typically, financial crises occur as an economy enters a recession that follows a prolonged boom in economic activity fuelled by credit creation and surges in capital inflows. The cycle of overlending is exacerbated by implicit or explicit deposit guarantees, poor supervision, and moral-hazard problems in the banking sector. Crises are accompanied by an overvaluation of the currency, weakening exports, and the bursting of asset price bubbles." (p.444)

Chuhan et al (1998) examine the sensitivity of capital flows to the Latin American and Asia Pacific countries. They find that about half of the explained increase in the capital flows to Latin America is attributed to the drop in the U.S. interest rates and the recession in the U.S. economy. In the Asian countries, on the contrary, country-specific factors are more important in explaining the pattern of the equity and bond inflows.

2.11 Summary

This Chapter gives a general overview of the main characteristics of emerging markets. In particular, there is a wide consensus that emerging markets exhibit high volatility of expected returns, non-normality of returns, low correlation with developed markets and within emerging markets. These characteristics and other (e.g. low liquidity, high concentration of stock markets, poor corporate governance) give strong evidence that emerging markets should be approached and treated in a way, that is different to the traditional techniques, used in developed markets, taking into account the unique properties of the former. Moreover, research on emerging markets needs to take into careful consideration processes like market liberalisation and market integration as the extent, to which emerging markets are liberalised and integrated, will have a direct effect on the behaviour of stock markets. Another issue, which have important implications for emerging markets research, is efficiency and predictability of expected returns in these markets. There is still a dispute among researchers on the degree of efficiency and predictability in emerging markets and some argue that one should distinguish between believing that a market is efficient and behaving as if the market

is efficient (Keane, 1993). Some researchers (for instance Kim and Singal, 2000) argue that market liberalisation and market integration significantly reduce predictability of returns in emerging markets. These issues and specific characteristics of emerging markets need to be addressed and given thorough consideration in this research.

CHAPTER 3

Literature Review Part II

3.1 Introduction

Chapter 3 identifies the main determinants of the stock market performance in emerging markets including micro- and macroeconomic variables like exchange and inflation rates, valuation ratios, country ratings and other. Section 3.2 gives an introductory overview of the determinants of the stock market performance. Section 3.3 examines sovereign yield spreads as potential indicators of the future equity market performance. Section 3.4 focuses on country ratings and Section 3.5 on valuation ratios like dividend yield, earnings/price ratios, trading volume and size. Section 3.6 and 3.7 discusses the impact of inflation rates and exchange rates on equity market performance respectively. The effect of demographics is discussed in Section 3.8. Section 3.9 focuses on country default risk as a determinant of stock market performance. The traditional approaches to measure country default risk are discussed in Section 3.10. The concluding remarks can be found in Section 3.11.

3.2 Determinants of stock market performance in emerging markets

There is a growing body of research on the determinants of equity market performance in emerging markets. Many researchers have examined macroeconomic and microeconomic variables, including the following financial and other non-financial variables like sovereign spreads (Gendreau and Heckman, 2003); country ratings (Erb et al, 1995, 1996b; Bekaert et al, 1997; Bekaert and Harvey, 2000a, Cantor and Packer, 1996a); valuation ratios (Campbell and Shiller, 1998; Fama and French, 1992; Maroney et al, 2004; Claessens et al, 1998; Groot and Verschoor, 2002, Ferson and Harvey, 1994); inflation rates (Erb et al, 1995; Hooker, 2004); exchange rates (Bailey and Chung, 1995; Harvey, 1995); population demographics (Bakshi and Chen, 1994; Bekaert et al, 1998) and other.

Many of these studies find that there are underlying differences between developed and emerging markets. The main issue is that emerging markets have not been fully integrated with the world markets, but are becoming more integrated as barriers to international investors are being gradually abandoned. Unfortunately, despite the growing interest in emerging equity markets the research findings in this area remain patchy and do not always form a complete account of the situation in these markets. From the analysis of determinants of stock market performance in emerging markets it appears that there are three main groups of determinants: risk factors (for instance, total risk, downside betas), macroeconomic factors (for instance, interest or exchange rates) and traditional valuation ratios (for instance, price/earning ratio or dividend yield).

For example, Harvey (2000) examines eighteen risk factors to find out their impact on the expected returns in forty-seven developed and emerging markets. These risk factors include total risk, idiosyncratic risk, size, semivariance measures, value at risk measure, downside betas, skewness and coskewness, country risk ratings and other. The results show that emerging markets exhibit different characteristics in comparison to developed markets and the former appear to be impacted by total risk measures. Hooker (2004) criticises Harvey (2000) for not including any macro variables in the list of eighteen risk factors. However, the results of his analysis provide strong evidence against the significance of most of the macro variables such as interest rates, inflation rates, exchange rate and GDP change. Hooker (2004) confirms that valuation ratios and financial risks variables including momentum, price/earning ratio and downside risk respectively appear to be robust predictors of emerging market equity returns. Moreover, Bekaert and Harvey (1995, 1997) find that both macro factors and valuation ratios have been useful to predict equity returns in emerging markets up through the middle 1990s.

In the following sections the macroeconomic and microeconomic determinants, identified in the existing literature, will be discussed in greater detail.

3.3 Sovereign Spreads

Rocha, K. and Alcaraz Garcia, F. (2004) view sovereign spreads[5] as the main determinants of the implied default probabilities in emerging markets. They use a structural model to estimate the term structure of sovereign spreads and incorporate real exchange rate as a trigger of a default event. They argue that real exchange rates are capturing changes in daily spreads sooner than other low-frequency fundamental variables. Ferrucci G. (2003) and Sy (2002) also argue that the sovereign yield spreads are important indicators of a country's default risk or sovereign risk and are often used as a tool of assessing external financing conditions and economic and political fundamentals in emerging markets. Ferrucci G. (2003) believes that yield spreads on emerging market economies' sovereign bonds are influenced by a large number of factors such as credit risks, liquidity risks and market risks as well as technical factors such as a change in the investor base. Ferrucci G. (2003) and Sy (2002) argue that the fair-value of the spread is a function of the probability of default of a country and the recovery rate in the event of default, where the probability of default is based on the fundamental variables reflecting the country's solvency and liquidity position. Ferrucci G. (2003) finds that the market rates fully reflect the fundamental-based sovereign credit risk, but non-fundamental factors also play an important role. Interestingly, Kamin and von Kleist (1999) (cited in Sy (2002), p.384) find that for a comparable credit rating sovereign bond spreads in Latin America are on average 39% higher than spreads in Asian when controlling for country, interest rates, time trends, and country dummies.

Gendreau and Heckman (2003) and Bandopadhyaya (2005) argue that sovereign spreads over the yields of the similar issues of the U.S. Treasury are often used by investors in emerging markets as indicators of country-specific risk and they have become an important measure of sovereign creditworthiness. Gendreau and Heckman (2003) argue, "because sovereign obligations such as Brady bonds or global bonds are not free from default risk, sovereign

[5] Rocha, K. and Alcaraz Garcia, F. (2004) define sovereign spreads as the yield difference between a risky and riskless bond with similar characteristics (p.2)

yield spreads vary with the market's perceptions of the ability and the willingness of the issuing government to service its external debt" (p.104).

More essentially sovereign yield spreads are used in predicting expected equity returns. Testing hypothetical portfolios of emerging market equities from 21 countries, Gendreau and Heckman (2003) show that the level of sovereign yield spreads is a potentially powerful indicator of future equity market performance across countries. They find that wide spreads indicate relatively strong future returns in the sample countries and vice versa. Also the deviation of a spread from the recent trend has some information about the future equity returns. This is consistent with research, which show that countries with low credit ratings tend to outperform the country with high credit raitings in the future (Gendreau and Heckman, 2003).

It is not surprising that sovereign spreads prove to be potential indicators of stock market performance in emerging markets as they can be considered as gauges of the overall investment climate in a country including the equity market according to Gendreau and Heckman (2003). They argue that sovereign spreads incorporate risk of external debt default and, hence, consequences of a default such as currency crisis, flight of capital, recessions and political upheaval (Gendreau and Heckman, 2003).

Sy (2002) studied the relationship between sovereign spreads and country ratings in 17 emerging markets and find the evidence that the periods with 'excessively high' spreads are on average followed by episodes of spread tightening 1 month later rather than credit downgrades, and the periods with 'excessively low' spreads are on average followed by rating upgrades 3 months later rather than by episodes of spread widening. Although it is reasonable to use sovereign yield spreads as a proxy of country political and external debt default risk, they might not be the best determinant of stock market performance and might be "diluted" by other factors. Clark and Kassimatis (2003), for instance, argue that sovereign

spreads and secondary market discounts on bank debt suffer a few shortcomings. They do not reflect the overall financial risk of the country but reflect the risk of the individual instruments and borrowers.

3.4 Country ratings

There has been a substantial amount of research on country credit ratings and their role in determining or influencing stock market returns in emerging markets. According to Kaminsky and Schmukler (1992) sovereign ratings have a direct impact on emerging financial markets, affecting not only bonds but also equity prices. While Moody's define the credit ratings as "a forward looking measure of the ability and willingness of a country's central bank to make available foreign currency to service debt, including that of the central government itself[6]," Sy (2002) argues that rating agencies "do not regard their ratings as providing either a prediction of the timing of default or an indication of the absolute level of risk associated with a particular financial obligation (p.381)." The nature and impact of country ratings on the subject economies have generated a considerable body of research where emerging countries have drawn a special attention.

According to Kaminsky and Schmukler (1992) sovereign ratings not only considerably affect bond and equity markets, they also cause cross-country contagion and spillover effects with less transparent economies affected most. They support the idea that sovereign downgrades usually occur during downturns and hence significantly contribute to the instability in emerging markets. Kaminsky and Schmukler (1992) argue that country ratings have a pro-cyclical behaviour, that is credit rating agencies tend to downgrade emerging markets in bad times and upgrade them in good times. They also say that rating changes have a dramatic effect on the prices of securities and bonds as well as affecting the pool of investors, because

[6] In Cruces (2006), p.30

institutional investors can only hold investment grade securities[7]. They find that a downgrade in sovereign ratings triggers average bond yield spreads to increase by 2 percentage points and average stock returns to increase by about 1 percentage point. They also argue that changes in rating agencies' outlooks appear to be important.

Erb, Harvey and Viskanta (1996) use country ratings as a proxy of country risk as they believe that the former reflect many of a country's fundamental risks including "political and other expropriation risk, inflation, exchange rate volatility and controls, the nation's industrial portfolio, its economic viability and its sensitivity to global economic shocks" (p.48). Erb, Harvey and Viskanta (1996b) and Bekaert et al (1997) study the relationship between country risk and equity returns in emerging markets based on Institutional Investor's country credit ratings and Political Risk Services' measures of political, economic and financial risk. They find that the country risk measures are correlated with equity returns in emerging markets. Bekaert and Harvey (2000a) find some evidence that country ratings significantly affect equity returns and also influence yield spreads on sovereign bonds (Cantor and Packer, 1996a) in emerging markets. Erb, Harvey and Viskanta (1995) have found that the country credit rating has strong predictive power for the average returns in emerging equity markets. They find meaningful correlation between lagged credit risk ratings and future equity returns and market volatility. And Erb, Harvey, and Viskanta (1996a, 1996b) and Harvey (2000) argue that higher political risk, reflected in country ratings, is associated with lower expected returns in emerging markets.

Hargis, Petry, and Trebat (1998), however, argue that sovereign ratings have limitations as they "change infrequently and do not allow investors to determine how ratings might change under different scenarios for fundamentals in each country" (p.65, 1998). And another limitation is that ratings, given by different country rating agencies, may differ substantially

[7] "When a credit rating agency downgrades a country's sovereign debt, all debt instruments in that country may have to be downgraded accordingly because of the sovereign ceiling doctrine" Kaminsky and Schmukler (1992), p.172

(Hargis et al, 1998; Cantor and Packer, 1996, for the broader review see Bouchet et al, 2003). Ferri, Liu and Stiglitz (1999) argue that credit ratings tend to exhibit procyclical behaviour. They found that "rating agencies attached higher weights to their qualitative judgement than to the economic fundamentals both reflected in their pre-crisis ratings and post-crisis rating downgrades, thereby exhibiting procyclical nature of rating assignment" (p.353). They also argue that this procyclical behaviour of credit agencies might have contributed to the boom and bust cycles in East Asia. Reisen and von Maltzan (1999) also argue that credit rating agencies have a potential to intensify or moderate boom-bust cycles in emerging markets.

Looking at the problem from a different angle, Kaminsky and Schmukler (1992) argue that "stock markets can be adversely affected by the downgrading of sovereign bonds because governments may raise taxes on firms (reducing firms' future stream of profits) to neutralise the adverse budget effect of higher interest rates on government bonds triggered by the downgrade. These cross-asset effects can be large". (p. 173)

Moreover, Cruces (2006) finds that credit ratings exhibit volatility clustering (i.e. maximum rating volatility in countries with potential default), asymmetric adjustments (i.e. mean reversions in ratings in certain ranges of the scale), and material non-zero mean revisions that are serially correlated especially in emerging markets. In contrast to emerging markets, developed countries usually exhibit relatively small changes in ratings. In connection to serial correlation in rating downgrades (upgrades) Cruces (2006) suggests that "serial correlation in revisions does imply that the standing rating is not necessarily the best forecast of expected collection for debt which matures beyond the credit rating window" (p.28).

Studying the causes of the largest one-day price changes in East Asian stock markets, Kaminsky and Schmukler (1999) (in Cruces, 2006) find evidence that equity prices fell between 11% and 14% during the days, when credit ratings downgrades were announced.

According to their findings credit rating downgrades had the largest impact on stock markets among other event variables like the IMF agreements or political news.

Erb et al (2000) point out that there is evidence that country ratings play a key role in the pricing and returns of emerging market sovereign bonds and that sovereign spreads usually reflect the market participants' view of expected changes in sovereign ratings. As an example of the latter, they say that some investors base their trading strategies on the expectations of the cyclical changes in credit ratings. Sy (2002) cites two empirical studies, which provide evidence that country ratings are consistent with basic economic fundamentals. The first one is Cantor and Parker (1996), who used Moody's and S&P's country ratings on 49 countries as of September 1995 and found that "high ratings were associated with high per capita income, low inflation, more rapid growth, a low ratio of foreign currency external debt to exports, the absence of a history of default on foreign currency debt since 1970, and a high level of economic development (as measured by the IMF's classification as an industrial country)" (Sy (2002), p.138). The second study was Juttner and McCarthy (1998)[8] who found that "the factors identified by Cantor and Packer continued to adequately explain the ratings in 1996 and 1997, but this relationship broke down in 1998, in the wake of the Asian crisis" (p.138). Juttner and McCarthy (1998) argue that in 1998 additional variables, namely problematic bank assets to GDP and the interest rate differential need to be considered

Erb et al (1995) find that country ratings account for 30% of the cross-sectional variation in the average equity returns, when the six-month lag on the country ratings is used to allow for full information. Interestingly, they find that credit ratings are correlated more with foreign currency in comparison to equity returns and that country ratings are possibly proxying for the dividend yield. They find a highly significant correlation (85%) between the average dividend yields and average credit ratings over the 1980-1993 period. However, country

[8] Junttner, J. and McCarthy, J. 1998. Modelling a Rating Crisis, Macquarie University, Sydney, Australia, unpublished

ratings are found to be a more meaningful factor than dividend yields in explaining the variance in equity returns. They also find a strong positive relation between credit ratings and beta, indicating that countries with lower betas have higher credit risk.

As part of this research, the performance of the Institutional Investor's country ratings as a determinant of the stock market behaviour in emerging markets will be tested and the relationship between the country ratings and other variables will be closely examined.

3.5 Valuation ratios

Although the market efficiency theory says that the stock market returns are not predictable, still the valuation ratios play an important role in predicting future equity returns. Valuation ratios are believed 'to extract information in prices about risk and expected returns (Keim, 1988 in Fama and French, 1992, p.428). On the other hand, Fama and French (1992) also argue that most of valuation ratios are scaled versions of price and therefore are redundant for describing average returns. They argue that valuation ratios mimic the underlying common risk factors in equity returns and according to the asset-pricing model should be no more than proxies of β. However, the empirical findings point out that valuation ratios capture risk factors, which are missed out by the beta of the capital asset-pricing model.

There are numerous papers on the role of valuation ratios in forecasting future equity returns mostly in developed markets (Campbell and Shiller, 1998; Fama and French, 1988, 1992; Frankel and Lee, 1999; Rapach and Wohar, 2005; Phillips, 1999 and other). Unfortunately, there are only a limited number of papers focused on emerging markets (Maroney et al, 2004; Claessens, Dasgupta and Glen, 1998; Groot and Verschoor, 2002, Rouwenhorst, 1998).

There are different views on the predictable power of valuation ratios in forecasting future returns. Campbell and Shiller (1998) show that the conventional valuation ratios such as dividend-price and price-earnings ratios are particularly powerful in predicting returns when

compared with many other statistics, used in forecasting stock prices. Fama and French (1992) show that there are strong relations between average returns and size, leverage, E/P and book-to-market equity. Maroney, Naka and Wansi (2004) have studied weekly equity market total returns in six East Asian countries and argue that leverage ratios are important in predicting market returns.

Using data from International Finance Corporation (IFC) for eighteen developing countries, Claessens, Dasgupta and Glen (1998) examine the effect of β, size and trading volume on asset returns. They argue that these factors have significant explanatory power in a number of the sample markets with dividend yield and earning/price ratios being also important but in fewer markets. Moreover, the study shows that the relationship between size, trading volume, dividend yield, earning/price ratios and return is contrary to the relationship between the same variables in many developed markets. This is especially true for size. The study shows that the importance of earnings-to-price ratio is limited (Claessens, Dasgupta and Glen, 1998).

Groot and Verschoor (2002) examine the relationship between expected stock returns and size, and market-to-book ratio in India, Korea, Malaysia, Taiwan and Thailand. They find a strong size effect in all markets, in the sense that small firms in Pacific Asian countries outperform large companies. This is in contrast to the findings of Claessens et al (1998), who find a premium for large firms in emerging markets and the findings of Estrada (2000), who finds that size is not a significant variable in explaining mean returns in emerging markets at all. Groot and Verschoor also find a significant market-to-book effect in Korea, Malaysia and Thailand, while Chui and Wei (1998) find the book-to-market equity significant in Hong Kong, Korea and Malaysia (in Groot and Verschoor, 2002). And Rouwenhorst (1998) finds that momentum and size are significant variables in explaining emerging stock market returns, as well as the evidence that value stocks outperform growth stocks. He does not find enough evidence that liquidity explains emerging market returns premium.

Ferson and Harvey (1994) study the fundamental determinants of stock market returns: valuation ratios (price-to-book-value, cash-flow, earnings and dividends), relative economic performance (GDP, country inflation and inflation volatility), and industry structure. They find that average returns in 21 developed countries are related to the volatility of their price-to-book ratios and predictable variation in returns is also related to relative GDP and, interest rate levels, and dividend-price ratios. However, this relationship might not be the same in emerging economies.

Estrada (2000) finds that total risk, measured by standard deviation, is a significant variable, explaining over 30% of the variability in stock returns, while systematic risk has no explanatory value across emerging markets. This implies that diversifiable risk is priced in emerging markets. Interestingly, when Estrada (2001) uses the same approach but looks into stock returns across industries in emerging markets, the results contrast those found in Estrada (2000). Namely, systematic risk becomes significant and total risk is no longer significant in explaining stock returns across industries[9] in emerging markets as opposed to mean returns across emerging markets. Estrada (2000) also finds that idiosyncratic risk is significantly related to stock returns and explains almost 25% of their variability and three downside risk variables (the semideviation with respect to the mean, the downside beta, and the VaR) are also significantly related to stock returns and explain between 15% and 23% of their variability across emerging markets. But these measures of risk are not significant across industries in emerging markets.

Valuation ratios play an important role in predicting expected returns in established markets, but they should be used with caution in emerging markets as the fundamentals in these markets might be distorted due to a number of reasons, discussed in the thesis. The

[9] Estrada (2001) groups the MSCI universe of companies into 38 industry groups and 8 economic sectors.

overview of the performance of valuation ratios as explanatory variables is presented in Table 2 below.

Table 2. The performance of valuations ratios as explanatory variables across the studies

Traditional valuation ratios		
P/E ratio (also price-smoothed-earnings ratio)	Predictive power	Campbell and Shiller (1998)
Earning-to-price ratio	Limited importance	Claessens, Dasgupta and Glen (1998)
Dividend yield	In fewer markets	Claessens, Dasgupta and Glen (1998)
Dividend-price ratio	Predictive power	Campbell and Shiller (1998)
	Predictive power	Ferson and Harvey (1994)
Book-to-market equity	Capture the cross-sectional variation in average stock returns	Fama and French (1992)
Trading volume	Significant explanatory power	Claessens, Dasgupta and Glen (1998)
Market-to-book ratio	Significant effect	Groot and Verschoor (2002)
Price-to-book value		Ferson and Harvey (1994)
Cash flow		Ferson and Harvey (1994)
Momentum	Important for many of the markets	Bekaert et al (1997)
Market capitalisation or size	Capture the cross-sectional variation in average stock returns	Fama and French (1992)
	Significant explanatory power	Claessens, Dasgupta and Glen (1998)
	Strong size effect	Groot and Verschoor (2002)
Leverage	Predictive power	Maroney, Naka and Wansi (2004)
Beta	Significant explanatory power	Claessens, Dasgupta and Glen (1998)

Chui and Wei (1998) examine the relationship between expected stock returns and market beta, book-to-market equity, and size in five Asian countries: Hong Kong, Korea, Malaysia, Taiwan, and Thailand. They find a weak relationship between equity returns and market beta in all countries, but valuation ratios can explain some variation in equity returns. They find that the book-to-market equity can explain the cross-sectional variation of expected equity returns in Hong Kong, Korea, and Malaysia, while the size effect is found significant in all sample countries except for Taiwan. They also find seasonal effects in stock market behaviour in these countries. They find a 'turn-of-the-year' effect in Hong Kong for large companies and in Korea for small firms. Chui and Wei (1998) suggest, the reason for higher returns in January in these countries might be a different composition of investors, i.e. foreign

institutional investors constitute the majority in Hong Kong, whereas private investors prevail in Korea.

3.6 Betas

According to the capital asset-pricing model the expected stock returns should be positively related to their market βs and therefore βs should explain the cross-sectional variation of expected returns (Fama and French, 1992). Although some authors (Black, Jensen, and Scholes, 1992; Fama and MacBeth, 1973 cited in Fama and French, 1992) find a positive relation between average stock returns and β in the period before 1969 in developed markets, Fama and French (1992) argue that this relation disappears during the more recent 1963-1990 period. The same results, that average stock returns are not positively correlated with βs in developed markets, are also found in Reinganum (1981) and Lakonishok and Shapiro (1986) (cited in Fama and French, 1992). Similarly, Ferson and Harvey (1994) find that the world market betas do not explain cross-sectional differences in average returns.

The research in emerging markets shows similar results. Chui and Wei (1998) find a flat relationship between market beta and average return in five Asian Pacific countries, "even when beta is corrected for measurement error and used alone to explain average returns" (p.181). Moreover, Bekaert et al (1997) argue that because emerging markets are not fully integrated into world capital markets, beta is not useful in explaining the cross-section of average returns as it is not an appropriate measure of risk in segmented markets.

Harvey (1995) finds no relationship between expected returns and world betas in emerging markets. He shows that a regression of average returns on average betas produces an R^2 equal to zero. In later research Harvey (1995b) finds that only one country out of twenty emerging markets has a beta greater than 1. Further in his research he examines the exposure of emerging markets to the following global risk factors: the world-market equity return, the return on a foreign currency index, a change in the price of oil, growth in world industrial

production, and the world inflation rate. Only few among twenty emerging markets have proved to have considerable exposure to these factors. Harvey documents that the country variance does a better job of explaining the cross-sectional variation in expected returns.

Divecha, Drach and Stefek (1992) have constructed an emerging markets model to understand risk and returns in these markets, where local excess return is broken down into country factor return, industry return and return related specifically to the individual attributes of the companies. The results show that country factors explain a large proportion of variance in emerging market returns, suggesting that country differences play a more important role than, for instance, sector concentration. Drawing the conclusion from this evidence Divecha, Drach and Stefek (1992) argue that emerging markets are more homogeneous (i.e. all stocks tend to move together) than developed markets. The reason is that emerging markets are more concentrated than the developed markets and a single market force has a significant impact on equity price movements.

3.7 Inflation

The majority of studies show that there is a negative relationship between inflation and expected returns in developed countries and that the Fisher hypothesis does not hold in the stock markets (see Gultekin, 1983 and Erb et al, 1995 for the literature review). Only recently Boudoukh and Richardson (1993) find that nominal stock returns and inflation are negatively correlated in the short term, but positively correlated in the long term. However, in contrast to the latter statement, Erb, Harvey and Viskanta (1995) do not find a positive relation between long-term inflation and long-term average returns. Erb, Harvey and Viskanta (1995) extended their sample to 41 developed and emerging stock markets and found a significant negative relation between inflation and stock returns in most of the countries. They argue that the cross-sectional analysis shows that inflation conveys information about risk exposure. Supporting this argument they show that more than 50 percent of the cross-sectional variation in average inflation rates can be accounted for by country credit risk

ratings showing a significant relation between inflation and country risk (Erb, Harvey and Viskanta, 1995).

Erb, Harvey and Viskanta (1995) found that thirteen out of the sixteen countries had higher average returns in U.S. dollars during low-inflation periods, when in local currencies the same is true for nine out of sixteen markets. In general, the study show that low-inflation periods are associated with higher average returns whereas high-inflation periods are associated with lower average returns (Erb, Harvey and Viskanta, 1995).

According to the study by Erb, Harvey and Viskanta (1995) average inflation explains 29 percent of the cross-sectional variation in the average equity returns volatility and the relation between volatility and average inflation is positive. Thus, the level or changes in expected inflation should be important in forecasting equity returns. Moreover, country credit risk ratings account for more than 50% of the cross-sectional variation in average inflation rates. Erb et al state that "in general, the lower a country's perceived sovereign credit rating the higher the country's rate of inflation and the higher the expected rate of return on the country's stock and bond markets" (Erb, Harvey and Viskanta, 1995, p.37). Cutler, Poterba and Summers (1989) find that inflation together with market volatility has negative and statistically significant effects on market returns. In general, inflation in emerging markets has significant implications for equity returns as one of the common characteristics of emerging markets is high inflation or hyperinflation in many countries.

3.8 Exchange rate

Errunza and Losq (1997) present a thorough analysis of the effect of currency risk on expected returns in emerging markets. They find negative correlation between expected returns and exchange rates, which means that it is not necessarily true that foreign investors are exposed to a greater risk than domestic investors. They also argue that currency risk of real returns is smaller than for nominal returns and PPP (Purchasing Power Parity) reduce or

eliminate the effect of exchange rates for long-term investments. Furthermore, it is possible to hedge currency risk through certain financial instruments. And finally, high currency risk of emerging markets equity may overall reduce the risk of an international portfolio, given the low correlation between emerging and developed markets.

Bailey and Chung (1995) study the effect of exchange rate fluctuations on the risk premium of stock returns in Mexico. They argue that under conditions when price levels and exchange rates are significantly volatile and cannot be costlessly hedged, the share prices of exporting (importing) firms may have ex ante premium for exchange rate risk as they are adversely (favourably) affected by appreciation in the real value of the domestic currency. Moreover, share of firms, not involved in international trade, may also reflect " a currency risk premium due to the impact of exchange rate changes on foreign competitors, input costs, aggregate demand, or other factors, that affect cash flows and required returns" (1995, p.541-542).

Bailey and Chung (1995) found "some evidence that exchange rate fluctuations are a priced factor in cross-sections of national stock index returns converted into a common currency, but little evidence that these risks are priced has emerged from studies of cross-sections of stock returns from the same country" (p.542, 1995). According to the regression analysis results, Bailey and Chung (1995) show that the Mexican stock market perform poorly when currency and political risks are high supporting the fact that there are premiums for currency and political risks.

Harvey (1995) shows that the foreign exchange risk factor has some explanatory power in eight out of the twenty sample countries, and it is particularly important in explaining the aggregate index returns in Latin America and Asia. In several countries, Claessens, Dasgupta and Glen (1998) find that the exchange rate plays a significant role in explaining stock market returns, but only in local currencies. Ferson and Harvey (1994) find significant premiums associated with a measure of exchange rate fluctuations.

As shown above, the effect of currency risk on stock market performance can be disputable. On the one hand, it may reduce the overall risk of international portfolio due to low correlation between developed and emerging markets or it can be effectively hedged. On the other hand, currency risk being a priced risk can be a significant factor with some explanatory power.

3.9 Population demographics

In addition to other determinants Bakshi and Chen (1994) argue that demographics can affect stock market performance. They present two hypotheses: the life-cycle investment hypothesis and the investor's risk aversion hypothesis. The life-cycle investment hypothesis states that when getting older investors change their wealth allocation patterns switching from investing in housing to financial assets investment. The second hypothesis states that investors' risk aversion increases with age and older investors demand higher premium in the stock markets. Bekaert et al (1998) argue that population demographics affect the time-series and cross-section of expected asset returns. They found that countries with the highest rate of increase in average age are often the least developed and riskiest countries for international investment. Moreover, they present evidence that the demographic attributes contain some information about future long-term expected returns. According to Bekaert et al (1997) population growth, average age growth and average growth has only a limited ability to discriminate between high- and low-expected return countries.

Summarising, it can be shown that there are the following determinants of stock market performance, identified in the literature review: sovereign spreads (Gendreau and Heckman, 2003); country ratings (Erb et al, 1995, 1996b; Bekaert et al, 1997; Bekaert and Harvey, 2000a, Cantor and Packer, 1996a); valuation ratios (Campbell and Shiller, 1998; Fama and French, 1992; Maroney et al, 2004; Claessens et al, 1998; Groot and Verschoor, 2002); inflation rates (Erb et al, 1995; Hooker, 2004); population demographics (Bakshi and Chen, 1994; Bekaert et al, 1998) and exchange rates (Bailey and Chung, 1995; Harvey, 1995).

Thus, having provided the overview of the determinants of stock market performance, discussed in the literature on emerging markets, special attention will be given to country default risk as the main determinant of equity markets performance in the following sections.

3.10 Country default risk as a determinant of stock market performance

The vulnerability of emerging markets to financial crises raises serious considerations for foreign investors. The empirical evidence show that financial crises have a drastic effect on the stock markets causing dramatic drops in stock market indices in emerging countries. For instance, the Mexican stock market index dropped by 38.7% during the Mexican peso crisis (December, 1994 – February, 1995), Thai stocks fell by 48.4%, Indonesians by 81.7%, Malaysians by 58.4%, Philippines by 49.2% and Koreans by 63.1% during the Asian crisis (July – February, 1998). The Russian stock market collapsed, losing 41.3% in August 1998. Hence, the impact, caused by financial crises raises questions whether the international investors price the country default risk in emerging equity markets and how the probability of financial crises occurrence might affect the stock market performance.

Looking broadly on the issue of financial crises in emerging markets, it is worth giving a short overview of a more general concept of political risk as one of the determinants of stock market performance. In the literature a broad range of issues regarding political risks are discussed and there is a general consensus that political risk in any form does affect stock market performance (the research papers on political risk factors are summarised in Table 3).

Table 3. Summary of studies on political risks

	Political risk factor	Author(s)
1	Regulatory changes, currency and political crises	Bekaert, Erb, Harvey and Viskanta (1998)
2	Political events	Aggawal et al (2001), Kim and Wei (2001)
3	Country-specific political events (e.g. changes in laws and regulations, currency controls or capital flow barriers)	Bailey and Chung (1995)
4	Country-specific risk	Santis and Imrohoroglu (1997)
5	Country risk (proxied by country ratings)	Erb at al (1996), Diamonte et al (1996)
6	Political risk	Cosset and Suret (1995)
7	Political news	Chan and Wei (1996), Cutler et al (1989)
8	Default risk	Eaton and Turnovsky (1993)

Bekaert, Erb, Harvey and Viskanta (1998) argue that emerging markets are highly exposed to shocks caused by regulatory changes, currency and political crises. Aggawal, Inclan, and Lean (2001) and Bailey and Chung (1995) argue that important political events tend to cause sudden changes in volatility. They acknowledge that political risk has an impact on stock prices. Moreover, many studies focus on the impact of economic and political events in the form of news on equity market performance (Cutler et al, 1989).

Surprisingly, Santis and Imrohoroglu (1997) find no evidence of relation between expected returns and country-specific risk under the assumption that the markets are segmented. Only after the relaxation of the assumption of full segmentation, it appears that the systematic risk is priced in Latin America, but not in the Asian markets. However, Bekaert et al (1997) argue that political risk is a priced risk in emerging markets.

Most of the research papers, focused on the emerging equity markets, use a general concept of political or country risk and its role in increasing the stock market volatility (Kim and Mei, 2001; Chan and Wei, 1996; Cutler et al, 1989; Bittlingmayer, 1988; Agmon and Findlay, 1982; Diamonte, Liew, and Stevens, 1996). Diamonte et al (1996) argue that political risk plays a more important role as a determinant of equity returns in emerging markets than in developed countries. They show that average returns in emerging markets experiencing decreased political risk exceed those of emerging markets experiencing increased political risk by approximately 11 percent a quarter. Diamonte et al (1996) use the political component of the International Country Risk Guide (ICRG) as a proxy for political risk. This political risk score includes 13 components with different weightings like 'economic expectations versus reality', 'economic planning failures', 'political leadership', 'corruption in government', 'quality of bureaucracy' and other.

Cosset and Suret (1995) test the impact of political risk on the performance of international portfolios. They suggest that the inclusion of politically risky countries in international

portfolios improves their risk-return characteristics. They argue that political risk plays an important role in international portfolio investment decisions. They use the monthly political risk ratings of Political Risk Services as a proxy of political risk and study of its effect on the gains from portfolio diversification into developing countries (Cosset and Suret, 1995).

Kim and Wei (2001) use a components-jump volatility filter to assess the impact of political events on stock market performance in Hong Kong. The components-jump volatility filter is based on the ARCH-jump model presented in Jorion (1988). Dates with jumps in return movements, determined with the help of the filter, are associated with political news announcements, allowing to quantify the effects of political events on the return and volatility. Kim and Wei (2001) find that the unexpected return jumps in the Hong Kong stock market were closely associated with political events. Furthermore, the impact of political news is asymmetric with greater volatility effect, caused by bad news in comparison to good news. The main conclusion of this paper is that volatility movements are associated with political risk.

Chan and Wei (1996) study the impact of political news on the stock price volatility in Hong Kong, particularly focusing on blue-chip shares and red-chip[10] shares. They find that political news increase volatility of both blue chip and red-chip shares. While favourable or unfavourable political news are respectively correlated with positive or negative returns of blue-chip shares, none of political news affects the returns of the red-chip shares. They conclude that red-chip stocks are considered a safe haven from political shocks for investors in the Hong Kong economy.

Bailey and Chang (1995) argue that political risk has an impact on stock prices to the extent that the firms with significant foreign financing, foreign suppliers and customers may be

[10] Red-chip shares are a class of the stocks, which are controlled by the people's Republic of China state-owned enterprises (Chan and Wei, 1996)

adversely affected as a result of country-specific political events such as changes in laws and regulation, currency controls or capital flow barriers. Eaton and Turnovsky (1983) identify the default risk as a factor of major consideration for foreign investors as they perceive foreign securities to be more subject to risk of default in comparison to domestic equities. Revisiting the interest parity theorem, Aliber (1973) argues that apart from the exchange risk foreign securities are subject to political risks, arising from the issuing countries. Moreover, he argues that certain securities, denominated in different foreign currencies, are subject to an identical political risk if they are issued in a similar legal jurisdiction (Aliber, 1973).

Clark and Kassimatis (2003) have estimated the macroeconomic financial risk premium for Argentina, Brazil, Chile, Colombia, Mexico and Venezuela for the period 1985-1997 and have found that it is a significant explanatory variable, which accounts for about 12% of annual variation in the equity returns. They find no country specific fixed effects and the similar sensitivity to changes in the financial risk premium among the countries. While the financial risk premium is significant in Argentina, Clark and Kassimatis (2003) show that its effect is offset by the beef cycle, which is negatively correlated with the financial risk premium.

Karmann and Maltritz (2002) use the structural model to evaluate sovereign ability-to-pay and probabilities of default, based on the existing foreign exchange reserves and the potential of capital imports, and implicit volatility, inferred from market spreads. They argue that their approach predict default events well in advance of agencies and markets in the case of Latin America and Russia.

In conclusion it should be noted that there is a general consensus that political risk does affect the stock market performance. As shown above many researchers consider different factors of political risk in connection to stock price volatility and impact on stock price movements. The main difficulty in assessing the effect of political risk on stock market performance lies

in identifying and measuring political risk because of the broad nature of the latter. While many researchers (Erb et al, 1996; Diamonte et al, 1996; Bailey and Chung, 1995, Aggawal, Inclan, and Lean, 2001 and other) consider political risk in the form of political events and country ratings, there have been only few attempts to narrow down political risk in emerging markets to country default risk (Eaton and Turnovsky, 1983; Clark and Kassimatis, 2003) as a proxy of broader political risk. As stated above the aim of this research is to look at country default probabilities and their impact on stock market performance in emerging markets. In the next section the concept of country default will be discussed in greater detail.

3.11 Country default and traditional approaches to measure default risk

According to Clark and Kassimatis (2005) country default risk refers to "to the probability that a country will be unable to generate enough foreign exchange to enable its residents, both public and private, to meet interest and principle payments on their foreign debts" (p.3, 2005). Stein and Paladino (2001) limit the concept of a default to a situation where the firms or government of a country reschedules the interest/principal payments on the external debt.

Kutty (1990) argues that default occurs if any one or more of the following events are encountered: (a) if a country fails to service its debt as and when it is due; (b) if a country asks for rescheduling before or after the payment is due; (c) if the creditor voluntarily reschedules the debt when a debtor country encounters financial difficulties, (d) if a country asks for restructuring of its debt before or after the payment is due; and (e) if a country experiences balance of payment difficulties and the creditor/s or other lending agencies or countries voluntarily or involuntarily offer balance of payment finance to alleviate the financial difficulties.

Clark and Kassimatis (2005) argue that a country default or an increase in probability of default will lead to increased uncertainty in the business environment. The consequences of a country default are volatility of exchange rates, inflation and interest rates, resource

reallocation and income redistribution among others (Clark and Kassimatis, 2005). Another result of a country default is an increase in the cost of capital, which will affect the investment climate, reducing the number of investment opportunities because of negative net present value of previously profitable investment projects. This in its turn will be reflected in decreased stock market returns. In accordance to Clark and Kassimatis (2005) Berardi et al (2004) argue that sovereign debt is a function of reputation costs and sanctions and that the decision to default of a particular country depends on the cost of future access to credit markets and the threat of economic and political retaliations (see also Eaton and Gersovitz, 1981; Bulow and Rogoff, 1989; Gibson and Sundaresan, 2001).

There are two commonly used indicators of the likelihood that a borrower will default on its obligations. First of all, it is sovereign ratings. The shortcomings of the use of sovereign ratings have been discussed earlier in Chapter 2 and include a broad nature of country ratings, which means that they indicate not only the probability of default, but provide a more general outline of political risks in a particular country. Another shortcoming is that the ratings of the main providers Moody's and Standard & Poor's may differ substantially.

Another traditional way of measuring debt-servicing capacity is by the means of ratios such as the ratio of the balance on current account to debt service payments and the ratio of external debt to exports. However, Stein and Paladino (2001) argue that these ratios do not show "the vulnerability of debtor countries to oncoming debt servicing problem, or signal in advance an imminent situation of payments interruptions" (p.135, 2001). Abdullah (1985) argues that the traditional ratios ignore the overall international liquidity position of the debtor country, "including availability of drawings on international financial institutions, and emergency financing from private lending institutions" (p.136, 1985). Abdulllah (1985) argue that the most crucial indicators of deterioration of debt servicing capability are the erosion of liquidity and political instability.

The World Debt Tables use the ratio of total debt service to exports of goods and services (Debt-Service Ratio), the ratio of total debt service to GNP, and the ratio of total international reserves to debt outstanding and disbursed as indicators of the quality of a country's debt. The traditional debt-service ratio has become a rule of thumb to judge about the likelihood of debt rescheduling and has proved to be a significant indicator of a country's creditworthiness (Rohmana-Moghadam, Samavati and Haber, 1991; Gershon, Just and Ross, 1981). Morgan (1986) argues that there are three variables, which are found to have great explanatory power in predicting debt service difficulties: real GDP growth, debt service ratio and the ratio of imports to reserves.

Oshiro and Saruwatari (2005) use a different approach to quantify the sovereign risk. They use the stock price index as a proxy for the equity value of the country and a size parameter as a conversion factor of the stock price index to the equity value of the country. To calculate the probability of default they adopted the extended Black-Scholes-Merton option-pricing model. They demonstrated that the model served as an early warning indicator in the Argentina debt crisis and Thailand currency crisis.

Balkan (1992) finds an inverse relationship between rescheduling probabilities for a given country and its level of democracy as well as a direct relationship between rescheduling probabilities and the level of political instability. Citron and Nickelsburg (1987) find that political instability tends to be an important component of the probability of default. Their hypothesis is "that when governments are changing frequently, the marginal benefit of default relative to alternative policies becomes positive, and when they are not changing frequently that ability-to-pay factors such as export earnings are more important.

3.12 Summary

The overview of the determinants of stock market performance in emerging markets has been given in this thesis. Despite the scarce and patchy research coverage of determinants of equity markets performance in emerging markets, some commonly used determinants have been identified as shown in Table 4 and discussed in this chapter (The full analysis can be found in APPENDIX II).

Table 4. The analysis of the studies on the determinants of stock market performance in emerging economies

Date	Author(s)	Main determinants
2003	Gendreau B, Heckman L	Sovereign yield spreads
2002	Kaminsky G, Schmukler S	Country ratings, sovereign yield spreads
1996	Erb CB, Harvey CR, Viskanta TE	Country ratings
1996	Erb CB, Harvey CR, Viskanta TE	Country ratings
1997	Bekaert et al	Country ratings
2003	Clark, E, Kassimatis, K.	Country default risk
1993	Eaton, J. Turnovsky, J.	Country default risk
1995	Cosset J, Suret J	Political risk
1996	Diamonte RL, Liew JM, Stevens RL	Political risk
1996	Chan Y, Wei K	Political news
1995	Bailey W, Chung YP	Exchange rate
1995	Harvey C	Exchange rate
1995	Erb C, Harvey C, Viskanta T	Inflation
1994	Ferson W, Harvey C	Global economic risks
2004	Hooker M	Macrocconomic variables, valuation ratios
1999	Kassimatis K, Spyrou S	Monetary variables
2001	Muradoglu G, Metin K, Argac R	Monetary variables
2004	Maroney N, Naka A, Wansi T	Valuation ratios
1994	Claessens S, Rhee M	Valuation ratios
1998	Claessens S, Dasgupta S, Glen J	Valuation ratios
1998	Rouwenhorst G	Valuation ratios
2002	Groot C, Vershoor W	Valuation ratios
1994	Ferson W, Harvey C	Valuation ratios
1998	Patel S	Valuation ratios
1998	Chui A, Wei J	Valuation ratios
2000	Harvey C	Valuation ratios
1997	Tandon K	Market liberalisation
2000	Bekaert G, Harvey C	Country-specific liberalisation variable
2000	Henry P	Market liberalisation
2000	Basu P, Kawakatsu H, Morey M	Market liberalisation
2002	Hargis K	Market liberalisation
1997	Hargis K, Maloney W	Industrial production

They include risk factors (for instance, total risk, downsize betas), macroeconomic factors (for instance, interest or exchange rates) and traditional valuation ratios (for instance, price/earning ratio or dividend yield). Moreover, political risk has drawn attention of many

researchers (Bekaert et al, 1998; Aggawal et al, 2001; Bailey and Chung, 1995; Santis and Imrohoroglu, 1997; Erb at al, 1996; Diamonte et al, 1996; Cosset and Suret, 1995; Kim and Wei, 2001; Chan and Wei, 1996). However, only few (Eaton and Turnovsky, 1993; Clark and Kassimatis, 2003) have considered country default risk as the main determinant of stock market performance in emerging markets.

There are different approaches to measure the likelihood of country default including country ratings and traditional debt ratios. In this research a different approach to measuring the likelihood of the default is undertaken. It is based on calculating probabilities of country default using the structural form of the contingency claims model, which is discussed in greater detail in Chapter 4.

CHAPTER 4

Methodology

4.1 Introduction

Chapter 4 provides an overview of the methodology of the thesis including credit risk modelling and evaluation of an economy's value. Data sources and the description of the variables are presented in Sections 4.2 and 4.3. Section 4.4 outlines the general framework of the research addressing integration and cointegration issues. The section also explains the use of the factor analysis, model selection and ARCH/GARCH model in the research. Section 4.5 discusses the structural form of contingency claims model, developed by Black and Cox (1976) and Merton (1974, 1977). The section discusses the use of the structural form of contingency claims model to calculate probabilities of a country default. Subsection 4.5.2 discusses Clark's (1991a, b and 2002) model to estimate the financial risk premiums.

4.2 Data

The sample comprises ten emerging economies, including six Latin American (Argentina, Brazil, Chile, Colombia, Mexico, Venezuela) and four Asia Pacific countries (Indonesia, Malaysia, Thailand and the Philippines). The summaries of the most impotant economic and political events and dates within the period under consideration are presented in APPENDIX I.

All time series range from 1985 to 2003 and subject to availability in individual countries. Please note that for Indonesia some time series (for example, total returns) are available only from 1989. The sample period covers nineteen years, which provides nineteen annual observations and seventy-six quarterly observations for each country.

Total returns are obtained from DATASTREAM. Exchange and inflation rates as well as the U.S. interest rates are obtained from the International Financial Statistics books, published by

International Monetary Fund. Institutional Investors' country ratings are collected from the Institutional Investor Magazine starting from 1985. The following time series are obtained from World Development Indicators (WDI) (April 2005, ESDS International, (MIMAS) University of Manchester): GDP growth, exports and imports of good and services, current account, gross fixed capital formation and other. Long-term and short-term debt, interest payments and projections of interest payments and principal repayments are obtained from Global Development Finance (April 2006, ESDS International, (MIMAS) University of Manchester).

There are three main sources of emerging market indices: the International Finance Corporation (IFC), Morgan Stanley Capital International (MSCI), and ING Baring's Emerging Market Indices (BEMI). All these indices are based on a portfolio of stocks that account for a substantial coverage of the total capitalisation of each market (Bekaert et al, 1997). The comparison of the main emerging markets indices is given below in Table 5.

Table 5. The comparison of the main emerging indices

Source	Index	Time span	N of countries	Company selection categories
S&P/IFC[11]	Global index (IFCG)	Since 1976	33	1.size 2. liquidity 3.industry
	Investable index (IFCI)		22	
MSCI	Emerging markets free index (EMF)	Since 1988	26	1.capitalisation 2.industry 3.liquidity 4. float 5.cross-ownership
ING Barings	Investable index (BEMI)	Since 1992	20	1.foreign institutional investability 2. liquidity 3.frequent financial reporting and availability of high quality data

[11] Standard & Poor has acquired IFC database on emerging markets.

Bekaert et al (1997) have analysed all three indices and come to the conclusion that despite the hierarchical differences in the structure of construction, there are little differences in the behaviour of the three indices (for more details, please see Bekaert et al, 1997).

In these research S&P/IFCG index will be used as it presents the longest time series data set for the sample countries. The S&P/IFC Global Index represents the performance of the most active stocks in the respective markets and account for 75% of total capitalisation of all domestic listed shares in a particular country.

4.3 Description of the variables

The description of the variables, used in this research, is presented below. The total returns on the stock markets in the sample countries are used as the main dependant variable. All other variables are used as independent variables to examine their role in explaining the fluctuations of the stock market returns in Latin America and Asia Pacific.

Total returns (TR) – Total returns are calculated as year-to-year (or quarter-to-quarter) percentage change in the return index. A return index in its turn, according to the Datastream definition, represents "a theoretical growth in value of a share holding over a specified period, assuming that dividends are re-invested to purchase additional units of an equity or unit trust at the closing price applicable on the ex-dividend date". Gross dividends are used where available and the calculation ignores tax and re-investment charges. Adjusted closing prices are used throughout to determine price index and hence return index.

Financial risk premium (FRP) – The financial risk premium for the country is the difference between the risk-adjusted cost of debt (r_a) and the risk free U.S. interest rate: $r_a - r$. The risk-adjusted required rate of return on foreign debt is the yield that equates the

present value of nominal debt with its market value. The calculation of financial risk premium is discussed in greater detail in Section 4.5.2.

Foreign exchange (FX) (in local currency units relative to the U.S. dollar). We use the annual average exchange rates (based on monthly averages) as published by the International Monetary Fund in the International Financial Statistics books. The International Monetary Fund publishes the official exchange rates as determined by national authorities or the rate determined in the legally sanctioned exchange market.

Inflation (INF). We use the annual inflation based on consumer prices as published by the International Monetary Fund in the International Financial Statistics books. The International Monetary Fund measures inflation by the consumer price index, which reflects the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services that may be fixed or changed at specified intervals.

Institutional Investor's Country ratings (II) – Institutional Investor's country ratings are based on the semiannual survey of seventy-five to hundred bankers, who rate each country on a scale of 0 to 100, with 100 representing the smallest risk of default. Institutional Investor in its turn weights these responses by its perception of each bank's level of global prominence and credit analysis sophistication. The country ratings are published twice a year in September and March. Institutional Investor's country ratings are regarded to be the most comprehensive ratings covering 173 countries.

Gross domestic product (GDP) growth. We use the annual percentage growth rate of GDP at market prices based on constant local currency as published in the World Bank World Development Indicators. The World Bank defines GDP as the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not

included in the value of the products. It is also calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

Market integration (MINT) – Market integration is calculated as a ratio of the exports plus import to GDP. It is believed that the higher the proportion of exports plus imports to GDP, the higher the market integration.

Quick ratio (QR) – Quick ratio is calculated as a ratio of foreign reserves to short-term debt. It is believed that the higher the ratio, the more protection the country has against adverse financial conditions.

US interest rates (USR) – the bond equivalent of the Treasury bill rate is used under the assumption that the yield curve is not flat. The Treasury bill rate is taken from International Financial Statistics books, published by the International Monetary Fund, and refers to the annual average rate on U.S. government ten years constant maturities.

Sovereign spreads - It would be preferable to use sovereign bond spreads as another variable in the research. Sovereign bond spreads are considered to be a good indicator of country default risk and could be a challenging rival to the financial risk premium (FRP) and Institutional Investor's country ratings, used as explanatory variables in this research. Sovereign bond yields increase when the probability of country default increases triggering the drop in bond prices. Unfortunately, the historical data on sovereign bond spreads for the period under consideration is not readily available. The EMBI and EMBI+ sovereign bond yield indices, provided by JPMorgan, track government bond yields in emerging markets and calculate the spreads between them and the benchmark financial instruments in the developed countries. However, these sovereign bond yield spreads are available only from 1994 and therefore will not provide sufficient data observations for this analysis.

However, with sufficient data observations for sovereign bond yield spreads it would be very valuable to find any statistically significant differences between actual yield spreads and financial risk premiums. Another application of sovereign bond yield spreads would be in the calculation of the implied collateral for emerging markets as the financial risk premiums could be substituted by sovereign bond yield spreads.

4.4 General framework of the research

The main objective of this research is to find the determinants of the total returns on stock markets in emerging economies. For this purpose a multivariate linear model with a wide range of macroeconomic explanatory variables is used to explain the fluctuation of the stock markets:

$$Y_t = \alpha_1 + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_n X_{nt} + u_t \qquad (1)$$

where Y is the dependant variable, X_2 and X_n are the explanatory variables, u is the stochastic disturbance term, and t is the tth observation.

The dependant variable is the total returns (TR) and the explanatory variables are financial risk premiums (FRP), foreign exchange rate (FX, in local currency to the U.S. dollar), inflation rate (INF), market integration (MINT, exports plus imports to GDP), the Institutional Investor's country ratings (II), GDP growth (GDP), the U.S. interest rates (USIR), quick ratio (QR, foreign reserves to short-term debt). Most of the variables are readily available from the market date providers apart from the financial risk premiums. The calculation of the financial risk premiums is discussed in Section 4.5.2 below.

4.4.1 Integration and cointegration

All time series are tested for a unit root using the Augmented Dickey-Fuller (ADF) test. Additionally the Augmented Engle-Granger (AEG) is used to test the time series for cointegration (Gujarati, 2003, p.823). The Augmented Engle-Granger (AEG) test requires to run a regression in order to obtain the residuals and test them for a unit root using the

Augmented Dickey-Fuller (ADF) test. If the residuals turn to be stationary, the time series under consideration are cointegrated.

4.4.2 Factor analysis

The principal components analysis as a method of data reduction is used to identify redundant variables among highly correlated variables. It finds a linear combination of variables in a form of a component that accounts for as much variation in the original variables as possible. It then repeats the procedure finding another component, which accounts for as much of the remaining variation, until there are as many components as original variables. The components, which account for most of the variation, can replace the rest of the variables (See Kim and Mueller, 1978 and Child, 1970 for more details).

The extraction communalities, the estimates of the variance accounted for by the components, are not reported as they are high for all variables. Otherwise the variables with low extraction communalities should be dropped from the analysis. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy statistic, the high values of which means that the factor analysis may be useful with the time series under consideration, and Bartlett's test of sphericity, which should be at less than 5% significance level to indicate that a factor analysis is meaningful, are reported.

4.4.3 Model selection

Two model selection criteria are used in the course of the data analysis to identify the model with the best fit. These criteria are Akaike Information Criterion and Schwarz Bayesian Criterion.

The Akaike Information Criterion (AIC) can be defined as follows

$$AIC = \log(\sigma^2) + 2p/n \qquad (2)$$

where σ^2 is the maximum likelihood estimator of the variance of regression disturbances, u_t, given by σ^2 = RSS/n, p is the number of freely estimated parameters and n is the number of observations (See Pesaran and Pesaran, 1997, p.353). The model with the lowest algebraic value of AIC is chosen.

The Schwarz Bayesian Criterion is defined as

$$SBC = \log(\sigma^2) + (\log n/n)p \qquad (3)$$

where σ^2 is the maximum likelihood estimator of the variance of regression disturbances, u_t, given by σ^2 = RSS/n, p is the number of freely estimated parameters and n is the number of observations (See Pesaran and Pesaran, 1997, p.354). The model with the lowest algebraic value of SBC is chosen.

4.4.4 ARCH/GARCH

The conditional variance is a weighted average of a long-term average (the constant), the forecasted variance from last period (the GARCH period), and information about volatility observed in the previous period (the ARCH term).

$$X_t=\alpha_0+\alpha_1 X_{t-1}+u_t \qquad (4)$$

$$var(u_t)=h_t^2=\beta_0+\beta_1 u^2_{t-1}+\varphi_1 h^2_{t-1} \qquad (5)$$

h_t^2 is called the conditional variance and represent one-period ahead forecast variance based on the past information. The conditional variance is a function of three terms:

- a constant term β_0;
- the ARCH term u^2_{t-1} – information about volatility from the previous period, measured as the lag of the squared residual from the mean equation;
- the GARCH term h^2_{t-1} – last period forecast variance.

The (1,1) in GARCH(1,1) refers to the presence of a first-order autoregressive GARCH term and a first-order moving average ARCH term.

The GARCH(1,1) model was meant to be used to avoid the volatility clustering using the conditional variance instead of the sample variance. The advantage of using the conditional variance is that the conditional variance is calculated as a weighted average of all of the lagged squared residuals down-weighting more distant lagged squared errors. Unfortunately, a flat log likelihood was encountered with the time series under consideration, and it was not possible to calculate the conditional variance, as the uphill direction in the sample variance could not be found.

4.5 Financial risk premium and credit risk modelling

This section discusses credit risk modelling as the theoretical underpinning of the calculation of financial risk premiums and the calculation of country default probabilities are detailed in Section 4.5.2.

4.5.1 Credit risk modelling

Credit risk modelling is dominated by the contingent claims model (Black and Cox, 1976; Merton, 1974, 1977). The structural models are based on Merton's (1974, 1977) theory for pricing bonds when there is a significant probability of default and bonds are considered as contingent claims on the borrowers' assets. The Merton's model computes the payoff at maturity of the bonds as the face value of the defaultable bond minus the value of a put option on the issuer's value with an exercise price equal to the face value of the bond (Merton, 1974). The model incorporates the possible gains or losses to bondholders as a result of unanticipated changes in the probability of default. The Merton's model is based on the assumptions that the relevant information for determining the probability of default is incorporated in the stochastic value of the firm, the level of debt obligations and the volatility of the firm's asset value. (Chou, 2005)

Black and Cox (1976) assume that the value of the firm follows a diffusion process and can fluctuate between upper and lower boundaries depending on the fortunes of the firm. Default may occur at any time between issuance and maturity of the debt, when the value of the firm jumps below the lower boundary. The boundaries may be defined exogenously by the indenture specifications or endogenously as a part of an optimal decision problem (Black and Cox, 1976).

There are also other approaches to estimation of country default probabilities. For instance, Eaton and Gersovitz (1981) propose a model of borrowing equilibrium with the level of an exogenous retaliatory penalty imposed by lender countries on borrowers as the main factor in assessing the probability of default. The model is identical to the maximum likelihood model and aims to estimate foreign debt markets equilibrium, based on loan demand and supply (that is desired borrowing and maximum permissible borrowing) and characteristics of borrowers, derived upon the level, average growth rate and percentage variability of the borrower's income, and the level of an exogenous retaliatory penalty imposed by lender countries on borrowers (Eaton and Gersovitz, 1981).

KMV Corporation has developed a distant-from-default metric to assess the probability of default risk. According to this approach, the distant-from-default metric measures how many standard deviations a firm's asset value is away from its default obligations. Higher value of distant-from-default means a low expected default probability as the firm's asset value is further away from the default point. And respectively, lower value of the distant-from-default indicates that the firm's assets are close to the expected default point, which means that expected default probability is higher. The estimation of the distant-from-default value is based on the firm's financial leverage level and the volatility of the firm's asset value (Chou, 2005).

Reviewing the literature review on economic models to predict debt rescheduling, Rivoli and Brewer (1997) say that numerous econometric studies have used logit analysis (Cline, 1984, 1983; Feder and Just, 1977; Frank and Cline, 1971; Moghadam and Samavati, 1991; Morgan, 1986; Snider, 1990; Saini and Bates, 1978; Mayo and Barrett, 1978, Feder, Just and Ross, 1981) or discriminant analysis (Frank and Cline, 1971; Sargen, 1977; Saini and Bates, 1978) to predict debt rescheduling in developing countries.

Having considered the structural form of the contingent claims model and provided a brief overview of other approaches to calculate probabilities of a country default, the most appropriate model for the given research is believed to be the structural form of contingent claims model. There are number of arguments to support the chosen model. First of all, the value of countries' economies are evaluated as analogous to a market value of a company's assets, discounting the present value of the net cash flows, which are net exports of an economy in the case of countries. Therefore, a country may default on its external debt payments similar to a company and, hence, the contingent claims model can be implemented to calculate probabilities of a country default. According to Clark and Kassimatis (2005), default of a country will occur when a country is unable to generate enough foreign exchange to meet interest and principle payments on its external debt. Therefore, the default risk is determined by the stochastic value of the economy, the level of debt obligations and the volatility of country economy's value.

4.5.2 Calculation of the financial risk premium

According to the methodology in Clark (1991a, b and 2002) the total value of economy, V is estimated as the USD value of a country's capacity to generate net exports at time T as V_T. This value is calculated as analogous to the market value of a company's assets, discounting the present value of the expected net cash flows. Instead of expected net cash flows the expected foreign exchange value, generated by the economy to service the external debt, is used when calculating a country's value. Clark and Lakshmi (2005) argue that this

methodology proves to be useful in determining country creditworthiness and in forecasting sovereign debt defaults and rescheduling.

The general methodological framework of the research as sated above is based on the structural form of thc contingent claims model. The default probability is calculated following Black and Scholes (1973), leaving the volatility of the economy's markct value σ unknown:

$$B_0 = V_0 N(-d_1) + Ke^{-rt} N(d_2) \tag{6}$$

where B is the dollar market value of the debt, V is the total value of economy measured in USD dollars and K is thc total nominal value of outstanding debt including principal and interest payments.

$$d_1 = \frac{\ln \frac{V_0}{K} + (r + \frac{\sigma^2}{2})t}{\sigma\sqrt{t}} \tag{7}$$

and

$$d_2 = \frac{\ln \frac{V_0}{K} + (r - \frac{\sigma^2}{2})t}{\sigma\sqrt{t}} \tag{8}$$

Then the implied volatility, calculated in Equation (6) to estimate d_2, is used. The normal cumulative estimated at d_2 gives the default probability implied by current market conditions (Clark and Lakshmi, 2005). (N(d_2) is the probability that value of economy will be greater than K, the nominal amount of debt outstanding, and consequently, 1 - N(d_2) or N(-d_2) is the risk-neutral probability of default.

The risk-adjusted required rate of return on foreign debt, r_a, is calculated as follows:

$$r_a = \frac{\ln(K/B_0)}{t} \tag{9}$$

where K is the nominal dollar amount of foreign debt outstanding, B is the dollar market value of the debt, and t is duration. The risk-adjusted required rate of return on foreign debt equates the present value of nominal debt with its market value. The financial risk premiums for the country is $r_a - r$, the difference between the risk-adjusted cost of debt (r_a) and the risk-free U.S. interest rate.

As the total outstanding country debt has different coupons and maturities, Clark (2002) proposes to define the economy's total nominal foreign debt as a sum of the principal payments plus interest payments over the life of all outstanding debt in order to make the debt data applicable in the option pricing model[12]. Clark (2002) estimates the market value of the country's total outstanding foreign debt as equal to 1 minus the discount on a straight vanilla government bond multiplied by total debt stocks as reported in the Global Development Finance Country Tables.

The maturity of the debt is calculated as its risk neutral duration as follows (Clark, 2002):

$$K e^{-rt} = \sum_{T=1}^{n} CF_T e^{-rT} \qquad (10)$$

where K is the total nominal value of outstanding debt including principal and interest, t is its maturity, r is the continuously compounded USD risk free rate of interest and CF_T is the debt service payment (interest plus principal) for each year. Equation (10) is solved for t to find the debt's risk neutral duration. This gives:

$$t = \frac{\ln(K / \sum_{T=1}^{n} CF_T e^{-rT})}{r} \qquad (11)$$

[12] Projections of the principal and interest payments are available in Global Development Finance Country Tables.

This section has given the general framework of the contingent claims model is used to estimate the probabilities of default. The calculation of the total value of economies is discussed in APPENDIX III.

CHAPTER 5

Empirical Analysis

5.1 Introduction

Chapter 5 discusses and interprets the main results of the empirical analysis. Section 5.2 examines the characteristics of stock markets in Latin America and Asia Pacific. Section 5.3 presents the empirical results with stationary time series and provides a country-by-country analysis of the main determinants of the stock market performance. The role of the U.S. interest rates, inflation and market integration in the emerging markets is discussed in Section 5.4. Section 5.5 summarises the main findings of the chapter.

5.2 Main characteristics of the stock markets in Latin America and Asia Pacific

Many researchers (Harvey, 1995a, 1995; Claessens et al, 1995; Bekaert, 1998; Bekaert and Harvey, 2002) find that returns in emerging markets are not normally distributed and moreover they tend to show significant skewness and kurtosis. Most of these findings are confirmed within the sample period from 1985 to 2003 in this research using quarterly data, however, some of the countries show slightly different characteristics. The characteristics of the stock markets in Latin America and Asia Pacific are discussed below.

5.2.1. Normality and volatility of the stock market returns

The emerging markets are well known for their volatility and it is not surprising to observe big swings from negative to positive returns in these markets. Nevertheless, the average annual total returns are significantly high in the period under consideration. The highest average annual returns between 1986 and 2003 have been experienced by Venezuela (37%) followed by Argentina (35%) and Philippines (35%) as shown in Table 6 (p.90). The lowest average total returns in the sample have been recorded for Malaysia (10%) and Thailand (18%).

Table 6. Annual total returns in the Latin American and Asian Pacific countries

	Years	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	Kurtosis
Total returns								Statistic	Statistic
Argentina	19	4.46	-0.49	3.97	0.35	1.06	1.12	2.71	8.37
Chile	19	1.82	-0.27	1.55	0.30	0.44	0.19	1.40	2.87
Mexico	19	1.49	-0.41	1.08	0.29	0.49	0.24	0.26	-1.12
Brazil	19	2.36	-0.66	1.70	0.26	0.68	0.46	0.56	-0.50
Colombia	19	2.34	-0.42	1.91	0.28	0.61	0.37	1.54	2.55
Venezuela	19	6.51	-0.49	6.02	0.37	1.49	2.21	3.59	13.93
LATIN AMERICA		**3.16**	**-0.46**	**2.71**	**0.31**	**0.80**	**0.77**	**1.68**	**4.35**
Philippines	19	4.45	-0.62	3.83	0.35	0.99	0.98	2.77	9.42
Indonesia	16	3.32	-0.74	2.58	0.25	0.84	0.71	1.56	3.23
Thailand	19	1.82	-0.79	1.03	0.18	0.49	0.24	-0.10	-0.11
Malaysia	19	1.75	-0.72	1.03	0.10	0.36	0.13	0.43	2.72
ASIA PACIFIC		**2.84**	**-0.72**	**2.12**	**0.22**	**0.67**	**0.52**	**1.17**	**3.82**

For example when Venezuela experienced the maximum returns of 6.02% in 1991, Thailand suffered the minimum returns of –79% together with Indonesia (-74) and Malaysia (-72) in 1998, the year after the Asian countries were hit by the full-blown financial crisis. The most volatile total stock returns were those of Venezuela with the standard deviation of 149% followed by Argentina (106%) and Philippines (99%), while Malaysia had the least volatile stock returns with the standard deviation of 36%. Table 7 shows that, when the means in two regions are compared, the mean of the total returns in Latin America is not statistically different from the Asia Pacific countries. It shows that the stock markets in the two regions experienced similar volatility, the question is whether the same factors can explain the fluctuations in the equity markets in these countries.

Table 7. Comparison of the means of the total returns in Latin America(LA) and Asia Pacific (AP)

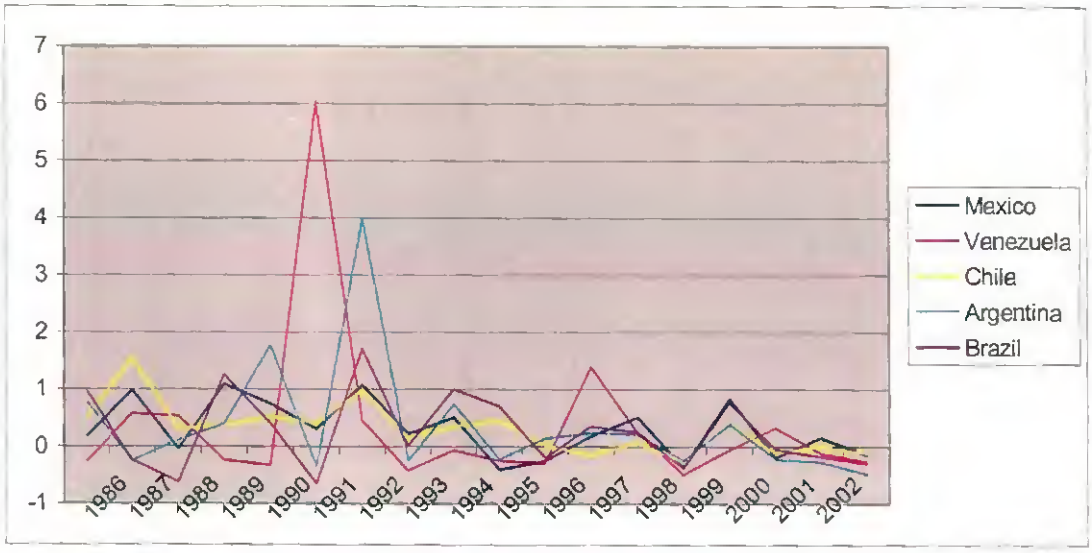
Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
LA	75	.0705135	.0175513	.1519991	.0355417	.1054853
AP	75	.0520358	.0250265	.2167357	.0021695	.1019022
Diff	75	.0184777	.0244456	.2117052	-.0302313	.0671866
Ho: mean(LA – AP) = mean(diff) = 0						

Ha: mean(diff) < 0	Ha: mean(diff) != 0	Ha: mean(diff) > 0
T = 0.7559	t = 0.7559	t = 0.7559
P < t = 0.7739	P > |t| = 0.4521	P > t = 0.2261

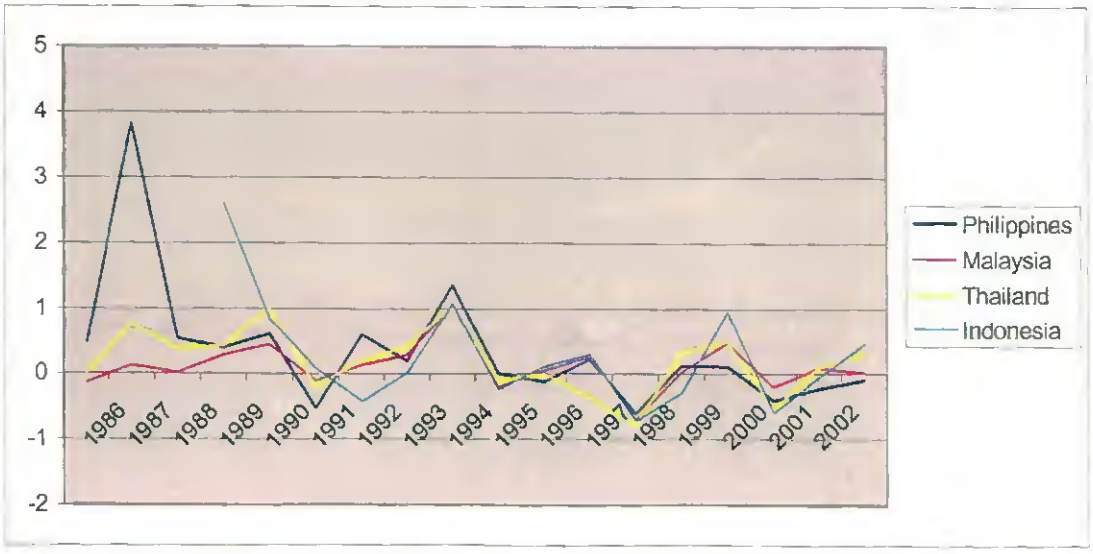
Interestingly, the data shows that negative returns were much higher in the Asian Pacific countries (-72%) than in Latin America (-46%). However, the overall volatility is higher in Latin America with the standard deviation of 80% than in the four Asian Pacific countries (67%). The average total returns on the stock market are slightly higher in the six Latin American countries (31%) in comparison to the Asian economies (22%) (See Table 6, p90).

Graph 1 and 2 show the total returns fluctuations in the Latin American and Asia Pacific countries between 1985 and 2003.

Graph 1. Total returns in 1985-2003 in Latin American countries



Graph 2. Total returns in 1985-2003 in Asian Pacific countries



Among all ten countries only Thailand shows slightly negatively skewed equity returns. The highest positive skewness is present in Venezuela, whose stock returns are also largely leptokurtic. The stock market returns in Argentina and the Philippines are also characterised by positive skewness and positive kurtosis. Three out of ten countries in the sample (Mexico, Brazil and Thailand) exhibit platykurtic total returns, but minimal skewness.

The positive skewness should not be the major concern as financial returns in general tend to be positively skewed. The problem is the normality of the returns. Many researchers point out the non-normality of the stock market returns in emerging countries and the example of the excess kurtosis and positive skewness give a supportive evidence. Within the sample, in five out of ten countries the quarterly equity returns exhibit the non-normality, while the total returns are normally distributed in other five countries.

As the Kolmogorov-Smirnov and Shapiro-Wilk tests show in Table 8, the quarterly stock market returns in Argentina, Colombia, Venezuela, Indonesia and Malaysia are not normally distributed (the null hypothesis of normality can be rejected). But they are normally distributed in Brazil, Chile, Mexico, Thailand and the Philippines.

Table 8. Tests of normality of the equity returns in Latin America and Asia Pacific

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Argentina	.189	67	.000	.687	67	.000
Brazil	.094	67	.200(*)	.973	67	.157
Chile	.068	67	.200(*)	.983	67	.495
Mexico	.066	67	.200(*)	.983	67	.477
Colombia	.154	67	.000	.709	67	.000
Venezuela	.101	67	.085	.903	67	.000
Indonesia	.200	67	.000	.840	67	.000
Malaysia	.135	67	.004	.935	67	.002
Philippines	.089	67	.200(*)	.939	67	.003
Thailand	.098	67	.179	.973	67	.156

* This is a lower bound of the true significance.
a Lilliefors Significance Correction

After a closer look at the total returns in those countries where they are not normally distributed, it appears that there are some observations, the so-called 'outliers', with abnormally high or low total returns. However, after careful examination of the fluctuations in the total returns on emerging stock markets and other explanatory variables, it has been found that in certain cases the explanatory variables do predict highly abnormal returns (for example, in Colombia the financial risk premium captured the highly volatile movements in the total returns or the market integration proxy in Indonesia). Therefore, there are supportive arguments to proceed with the further analysis despite the non-normality of the total returns in five countries. However, the results should be interpreted with caution.

5.2.2 The correlations among the emerging markets

A considerable number of researchers claim that emerging markers are weakly correlated with developed markets and also among themselves (Bekaert, Erb, Harvey and Viskanta, 1998; Harvey, 1995; Bekaert and Harvey, 2003; Bekaert, 1999; Kassimatis and Spirou, 1999; Errunza, 1994). The results in this research show slightly different results.

There are strong correlations among the Latin American countries and all statistically significant correlations are positive. However, Harvey (1995), for example, reports that Brazil is negatively correlated with Argentina and Mexico. The correlation matrix in Table 9 (p.88), on the contrary, shows that there is a significant positive correlation between Brazil, Argentina and Mexico. Mexico is the only country among the six Latin American countries, which is correlated with all other countries in Latin America except for Venezuela. Venezuela, however, is not correlated with any of Latin American countries and four Asia Pacific countries, being affectively fully isolated.

There are only three pair-wise correlations between the Latin American and Asian Pacific countries: Mexico and Indonesia, Chile and the Philippines, and Colombia and the

Philippines. All three correlations are positive. Otherwise, there are no correlations between the Latin American and Asian Pacific countries. This supports the view that these two regions are not correlated with each other and might have different underlying characteristics.

The Asian Pacific countries are highly correlated between each other with the correlation being positive as shown in Table 9. Thailand, for instance, is correlated with other three Asian Pacific countries and Indonesia also with Malaysia. Notably, the Philippines, being correlated with two Latin American countries, are correlated only with Thailand among the Asian Pacific economies.

Table 9. Correlations matrix of the total returns in Latin America and Asia Pacific

	ARG	BRAZ	CHIL	COLOM	MEX	VEN	IND	MAL	PHIL	THAI
ARG	1	.704 **	.419	.510 *	.555 *	-.115	.028	.232	.115	.222
BRAZ	.704 **	1	.326	.181	.555 *	-.324	.397	.314	.091	.158
CHIL	.419	.326	1	.756 **	.670 **	.108	.214	.161	.779 **	.426
COLOM	.510 *	.181	.756 **	1	.495 *	.162	-.217	.047	.559 *	.233
MEX	.555 *	.555 *	.670 **	.495 *	1	.065	.526 *	.355	.467	.391
VEN	-.115	-.324	.108	.162	.065	1	-.116	-.159	-.136	-.288
IND	.028	.397	.214	-.217	.526 *	-.116	1	.628 *	.510	.601 *
MAL	.232	.314	.161	.047	.355	-.159	.628 *	1	.388	.803 **
PHIL	.115	.091	.779 **	.559 *	.467	-.136	.510	.388	1	.611 **
THAI	.222	.158	.426	.233	.391	-.288	.601 *	.803 **	.611 **	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The correlation analysis in general shows that the Latin American countries are not correlated with the Asian Pacific economies. However, there are strong correlations within these two regions. Venezuela appeared to be an isolated economy as it does not correlate either with other Latin American countries or Asian Pacific countries. Surprisingly, the Philippines are found to be correlated with Chile and Colombia and only with Thailand in Asia Pacific.

5.3 Empirical results with the stationary time series

In the previous sections some preliminary analysis has been performed (e.g. normality test and correlation analysis) to understand the nature and the main characteristics of the stock markets in the emerging economies. To proceed further with the process of identifying the main determinants of the stock market performance, the unit root test is carried out to check whether any time series, used as explanatory variables in the analysis, exhibit a unit root or are non-stationary. The results of the Augmented Dickey-Fuller (ADF) unit root test are presented in Table 10 below. If the t-statistic is statistically significant, there is strong evidence against the null hypothesis that a time series has a unit root. Alternatively, statistically significant t-statistic indicates that a time series is stationary.

One of the big concerns when transforming data, i.e. taking the first differences in the case of this research, is that it might result in considerable information loss and some of the original relationships between the variables would not be detected. This issue will be addressed later in the thesis.

Table 10. ADF unit root test results (quarterly data)

	Argentina	Brazil	Chile	Colombia	Mexico	Venezuela	Malaysia	Indonesia	Philippines	Thailand
TR[13]	-8.707***	-9.262***	-8.069***	-7.997***	-8.953***	-7.019***	-9.333***	-8.17***	-7.501***	-10.26***
FRP	-2.441	-0.516	-0.261	-0.647	0.903	-2.09	-1.285	-1.661	-1.668	-4.064***
ΔFRP	-8.838***	-9.407***	-7.051***	-9.238***	-8.818***	-9.356***	-5.533***	-7.177***	-8.323***	
FX	-0.503	0.096	-1.156	1.176	-0.268	2.418	-0.788	-1.331	0.514	-1.085
ΔFX	-5.94***	-7.748***	-7.013***	-8.264***	-8.133***	-6.708***	-8.482***	-8.236***	-8.004***	-9.026***
INF	-2.213	n/a	-1.804	-0.27	-1.548	-2.37	-2.035	-3.036**	-3.495***	-2.117
ΔINF	-8.489***	n/a	-8.794***	-8.654***	-8.51***	-8.49***	-8.487***			-8.486***
MINT	-0.289	-0.709	-2.145	1.538	-1.499	-2.012	-1.392	-2.354	-0.567	-0.695
ΔMINT	-8.608***	-8.508***	-8.54***	-9.259***	-8.71***	-8.505***	-9.036***	-8.49***	-9.149***	-9.285***
II	-0.467	-1.052	-1.191	-1.022	0.277	-1.486	-1.531	-0.219	-0.75	-1.154
ΔII	-8.504***	-8.502***	-10.566***	-8.501***	-8.728***	-8.54***	-8.509***	-8.673***	-9.015***	-8.485***
USIR	-2.446	-2.446	-2.446	-2.446	-2.446	-2.446	-2.446	-2.446	-2.446	-2.446
ΔUSIR	-6.094***	-6.094***	-6.094***	-6.094***	-6.094***	-6.094***	-6.094***	-6.094***	-6.094***	-6.094***

Δ - first difference
*** indicates significance at the 1% level.
** indicates significance at the 5% level.

[13] TR (Total returns), FRP (Financial risk premium), FX (Foreign exchange rate), INF (Inflation), MINT (Market integration), II (Institutional Investor ratings), USIR (U.S. interest rates).

The results show that total returns (TR) on the stock markets in all ten countries are stationary. The level of the financial risk premiums (FRP) is stationary only in Thailand; in other nine countries the financial risk premiums become stationary after taking the first difference. Foreign exchange rates (FX), market integration (MINT), the Institutional Investor's country ratings (II) and the U.S. interest rates (USIR) are integrated of order 1, i.e. they become stationary after taking the first difference. Inflation (INF) is found stationary at the level only in two countries (Indonesia and the Philippines). In other eight countries the first difference of inflation is stationary. In Brazil the results of the unit root test of inflation are not available as Brazil experienced highly volatile inflation rates with short periods of the hyperinflations, which makes this variable unsuitable for the inclusion in the regression analysis.

Taking into account the results of the unit root test, the regression analysis is performed for each country individually to find out which of the variables under consideration can explain the behaviour of the stock markets in the emerging economies. Also the correlation analysis among the explanatory variables was performed and it was found that after taking the first difference, the correlations between most of the explanatory variables are lost or minimal.

In Argentina the results of the regression analysis are not very satisfactory as none of the variables is statistically significant to explain the total returns as shown in Table 11.

Table 11. Regression analysis results for Argentina

Dependent variable is TR

75 obs from 1985Q2 to 2003Q4

Regressor	C	ΔFRP	ΔFX	ΔINF	ΔMINT	ΔII	ΔUSR
Coefficient	**0.29561*** **	**0.75647**	**-0.23486**	**-0.000136**	**16.7872**	**0.0008487**	**-0.95494**

R-Bar-Squared	0.028873	Serial Correlation[2]	CHSQ(4)= 1.8287[.767]
F-stat.	F(7, 67) 1.3143[.257]	Heteroscedasticity[3]	CHSQ(1)= 4.7641[.029]
DW-statistic[1]	2.1237*		

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=75 d_L=1.598, d_U=1.652. (-), (Ind), and * stands for negative autocorrelation, indecisive zone and no correlation respectively.

[2]Lagrange multiplier test of residual serial correlation

[3]Based on the regression of squared residuals on squared fitted values

In Brazil none of the explanatory variables are statistically significant as well as shown in Table 12. The same results are obtained in Chile. The results are reported in Table 13.

Table 12. Regression analysis results for Brazil

Dependent variable is TR						
75 obs from 1985Q2 to 2003Q4						
Regressor	C	ΔFRP	ΔFX	ΔMINT	ΔII	ΔUSIR
Coefficient	**0.20372**	**-2.2071**	**-0.056367**	**-2.4802**	**0.080742**	**-10.0334**

R-Bar-Squared	0.028595	Serial Correlation[2]	CHSQ(1)= 1.1887[.276]
F-stat.	F(5, 12) 1.1001[.410]	Heteroscedasticity[3]	CHSQ(1)= .79545[.372]
DW-statistic[1]	2.4156[(Ind)]		

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=75 d_L=1.598, d_U=1.652. [(-),(Ind)], and * stands for negative autocorrelation, indecisive zone and no correlation respectively.
[2]Lagrange multiplier test of residual serial correlation
[3]Based on the regression of squared residuals on squared fitted values

Table 13. Regression analysis results for Chile

Dependent variable is TR							
75 obs from 1985Q2 to 2003Q4							
Regressor	C	ΔFRP	ΔFX	ΔINF	ΔMINT	ΔII	ΔUSIR
Coefficient	**0.073372*** **	**-1.2075**	**3.64E-04**	**0.037287**	**-1.6229**	**-0.005966**	**3.4892**

R-Bar-Squared	0.065124	Serial Correlation[2]	CHSQ(4)= 7.1961[.126]
F-stat.	F(7, 67) 1.7364[.115]	Heteroscedasticity[3]	CHSQ(1)= 8.5177[.004]
DW-statistic[1]	1.745*		

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=75 d_L=1.598, d_U=1.652. [(-),(Ind)], and * stands for negative autocorrelation, indecisive zone and no correlation respectively.
[2]Lagrange multiplier test of residual serial correlation
[3]Based on the regression of squared residuals on squared fitted values

In Colombia the first difference of financial risk premium (ΔFRP), the first difference of inflation rate (ΔINF) and the first difference of market intergration (ΔMINT) are significant variables in explaining the variance of the stock market returns (see Table 14, p.98). Although the serial correlation is not present, the model exhibits the heteroscedasticity.

Table 14. Regression analysis results for Colombia

Dependent variable is TR							
72 obs from 1986Q1 to 2003Q4							
Regressor	C	ΔFRP	ΔFX	ΔINF	ΔMINT	ΔII	ΔUSIR
Coefficient	0.058162	-5.1733***	4.97E-04	-0.13004*	-0.2770E-8**	-0.0050415	2.7168

R-Bar-Squared	0.083068	Serial Correlation[2]	CHSQ(4)= 5.7516[.218]
F-stat.	F(7, 64) 1.9189[.081]	Heteroscedasticity[3]	CHSQ(1)= 35.9398[.000]
DW-statistic[1]	1.8172*		

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641. (-), (Ind), and * stands for negative autocorrelation, indecisive zone and no correlation respectively.
[2]Lagrange multiplier test of residual serial correlation
[3]Based on the regression of squared residuals on squared fitted values

In order to check whether heteroscedasticity is caused by the redundant variables (i.e. presence of outliers or skewness in the redundant variables), a regression analysis including only ΔFRP, ΔINF and ΔMINT is performed. The results are presented in Table 15. Together ΔFRP, ΔINF and ΔMINT explain around 12% of the variance in the stock market returns. However, the problem of heteroscedasticity is still persistent and it might be caused by the non-normality of the total returns in Colombia as it was detected in Section 5.2.1.

Table 15. Regression analysis results with ΔFRP, ΔINF and ΔMINT for Colombia

Dependent variable is TR				
75 obs from 1985Q2 to 2003Q4				
Regressor	C	ΔFRP	ΔINF	ΔMINT
Coefficient	0.064695**	-4.2867***	-0.12433*	-0.2458E-8**

R-Bar-Squared	0.11802	Serial Correlation[2]	CHSQ(4)=5.0416[.283]
F-stat.	F(3, 71) 4.3008[.008]	Heteroscedasticity[3]	CHSQ(1)=36.4088[.000]
DW-statistic[1]	1.9509*		

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=75 d_L=1.598, d_U=1.652. (-), (Ind), and * stands for negative autocorrelation, indecisive zone and no correlation respectively.
[2]Lagrange multiplier test of residual serial correlation
[3]Based on the regression of squared residuals on squared fitted values

In Mexico the first difference of market integration (ΔMINT) and the first difference of the U.S. interest rates are statistically significant variables explaining 28% of the variance in the stock market returns. As shown in Table 16, the model does not exhibit serial autocorrelation, however, there is a heteroscedasticity problem.

Table 16. Regression analysis results for Mexico

Dependent variable is TR							
75 obs from 1985Q2 to 2003Q4							
Regressor	C	ΔFRP	ΔFX	ΔINF	ΔMINT	ΔII	ΔUSIR
Coefficient	**0.11934****	1.6404	0.0055026	0.011883	**-10.0664****	-0.025518	**24.6296*****
R-Bar-Squared	0.2869		Serial Correlation[2]		CHSQ(4)= 4.1982[.380]		
F-stat.	F(7, 67) 5.2531[.000]		Heteroscedasticity[3]		CHSQ(1)= 7.0632[.008]		
DW-statistic[1]	2.111*						

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=75 d_L=1.598, d_U=1.652.
(-),(Ind), and * stands for negative autocorrelation, indecisive zone and no correlation respectivcly.
[2]Lagrange multiplier test of residual serial correlation
[3]Based on the regression of squared residuals on squared fitted values

The first difference of the U.S. interest rates (ΔUSIR) is the only significant variable in the model, which explains the variance of the stock market returns in Venezuela (see Table 17). The model does not exhibit either serial correlation or heteroscedasticity.

Table 17. Regression analysis results for Venezuela

Dependent variable is TR							
75 obs from 1985Q2 to 2003Q4							
Regressor	C	ΔFRP	ΔFX	ΔINF	ΔMINT	ΔII	ΔUSIR
Coefficient	0.087845*	1.4780	-0.7434E-3	-0.0049418	-5.6130	0.022695	14.1151*
R-Bar-Squared	0.0058191		Serial Correlation[2]		CHSQ(4)= 2.4249[.658]		
F-stat.	F(6, 68) 1.0722[.388]		Heteroscedasticity[3]		CHSQ(1)= .27766[.598]		
DW-statistic[1]	1.7187*						

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=75 d_L=1.598, d_U=1.652.
(-),(Ind), and * stands for negative autocorrelation, indecisive zone and no correlation respectively.
[2]Lagrange multiplier test of residual serial correlation
[3]Based on the regression of squared residuals on squared fitted values

In Indonesia the first difference of market integration (ΔMINT) and the first difference of the U.S. interest rates (ΔUSIR) are statistically significant variables, which explain 22% of the variance in the total returns on the stock market (see Table 18). The model statistic shows no serial correlation or heteroscedasticity problems.

Table 18. Regression analysis results for Indonesia

Dependent variable is TR							
63 obs from 1988Q2 to 2003Q4							
Regressor	C	ΔFRP	ΔFX	INF	ΔMINT	ΔII	ΔUSR
Coefficient	**0.12860****	**1.5036**	**6.258E-06**	**-0.011765**	**-6.9579*****	**0.016851**	**22.0284****

R-Bar-Squared	0.22562	Serial Correlation[2]	CHSQ(4)= 6.0806[.193]
F-stat.	F(7, 55) 3.5805[.003]	Heteroscedasticity[3]	CHSQ(1)= .29788[.585]
DW-statistic[1]	2.1965*		

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641. $^{(-)}$, $^{(Ind)}$, and * stands for negative autocorrelation, indecisive zone and no correlation respectively.
[2]Lagrange multiplier test of residual serial correlation
[3]Based on the regression of squared residuals on squared fitted values

As shown in Table 19, the first difference of inflation (ΔINF) and the first difference of the U.S. interest rates (ΔUSIR) are statistically significant variables, which explain together 25% of the fluctuations in the stock market in Malaysia.

Table 19. Regression analysis results for Malaysia

Dependent variable is TR							
72 obs from 1986Q1 to 2003Q4							
Regressor	C	ΔFRP	ΔFX	ΔINF	ΔMINT	ΔII	ΔUSIR
Coefficient	**0.16172****	**-8.8238**	**-0.03252**	**-0.41574*****	**0.69519**	**-0.00488**	**10.1557***

R-Bar-Squared	0.25385	Serial Correlation[2]	CHSQ(4)= 10.1356[.038]
F-stat.	F(7, 64) 4.4507[.000]	Heteroscedasticity[3]	CHSQ(1)= .16565[.684]
DW-statistic[1]	2.3904$^{(Ind)}$		

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641. $^{(-)}$, $^{(Ind)}$, and * stands for negative autocorrelation, indecisive zone and no correlation respectively.
[2]Lagrange multiplier test of residual serial correlation
[3]Based on the regression of squared residuals on squared fitted values

In the Philippines none of the variables has proved to be significant as shown in Table 20.

Table 20. Regression analysis results for the Philippines

Dependent variable is TR							
72 obs from 1986Q1 to 2003Q4							
Regressor	C	ΔFRP	ΔFX	ΔINF	ΔMINT	ΔII	ΔUSIR
Coefficient	**0.053885**	**-5.1593**	**0.002678**	**-0.032422**	**5.55E-10**	**-0.024952**	**8.631**
R-Bar-Squared	0.069454		Serial Correlation[2]		CHSQ(4)= 4.0142[.404]		
F-stat.	F(7, 64) 1.7570[.112]		Heteroscedasticity[3]		CHSQ(1)= 1.8572[.173]		
DW-statistic[1]	2.0238*						

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641.
(-),(Ind), and * stands for negative autocorrelation, indecisive zone and no correlation respectively.
[2]Lagrange multiplier test of residual serial correlation
[3]Based on the regression of squared residuals on squared fitted values

In Thailand, as shown in Table 21, the first difference of inflation rate (ΔINF), the first difference of the Institutional Investor's country ratings (ΔII) and the first difference of the U.S. interest rates (ΔUSIR) are statistically significant variables, which explain 17% of the variance of the stock market returns. The model statistic shows no serial correlation or heteroscedasticity problems.

Table 21. Regression analysis results for Thailand

Dependent variable is TR							
75 obs from 1985Q2 to 2003Q4							
Regressor	C	FRP	ΔFX	ΔINF	ΔMINT	ΔII	ΔUSIR
Coefficient	**0.055264**	**1.2789**	**0.0033556**	**-.23184****	**0.5672**	**-.035736***	**18.7440*****
R-Bar-Squared	0.1726		Serial Correlation[2]		CHSQ(4)= 9.2882[.054]		
F-stat.	F(7, 67) 3.2053[.005]		Heteroscedasticity[3]		CHSQ(1)= .077276[.781]		
DW-statistic[1]	2.2545*						

[1]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=75 d_L=1.598, d_U=1.652.
(-),(Ind), and * stands for negative autocorrelation, indecisive zone and no correlation respectively.
[2]Lagrange multiplier test of residual serial correlation
[3]Based on the regression of squared residuals on squared fitted values

In summary, Table 22 shows the performance of all variables across the countries in the sample. The analysis shows that the main determinant of the emerging stock markets performance is the U.S. interest rates. The U.S. interest rates can explain the variance of the equity returns in two Latin American countries (Mexico and Venezuela) and three Asian markets (Indonesia, Malaysia and Thailand).

Table 22. Performance of the variables in the sample countries

Argentina	Brazil	Chile	Colombia	Mexico	Venezuela	Indonesia	Malaysia	Philippines	Thailand
C***[14]	C***	C***	C	C**	C**	C**	C**	C	C
ΔFRP	ΔFRP	ΔFRP	ΔFRP ***	ΔFRP	ΔFRP	ΔFRP	ΔFRP	ΔFRP	FRP
ΔFX	ΔFX	ΔFX	ΔFX	ΔFX	ΔFX	ΔFX	ΔFX	ΔFX	ΔFX
ΔINF	ΔINF	ΔINF	ΔINF*	ΔINF	ΔINF	INF	ΔINF***	ΔINF	ΔINF**
ΔMINT	ΔMINT	ΔMINT	ΔMINT**	ΔMINT**	ΔMINT	ΔMINT***	ΔMINT	ΔMINT	ΔMINT
ΔII	ΔII	ΔII	ΔII	ΔII	ΔII	ΔII	ΔII	ΔII	ΔII*
ΔUSIR	ΔUSIR	ΔUSIR	ΔUSIR	ΔUSIR***	ΔUSIR*	ΔUSIR**	ΔUSIR*	ΔUSIR	ΔUSIR***

Δ - first difference
*** indicates significance at the 1% level.
** indicates significance at the 5% level.

Market integration and inflation also play a significant role. Market integration (MINT) is a significant variable in explaining the behaviour of the stock markets in Colombia, Mexico and Indonesia. Inflation (INF) can explain the variance in the stock returns in Colombia, Malaysia and Thailand. The Institutional Investor's country ratings and financial risk premiums are significant only in two countries (in Thailand and Colombia respectively). The U.S. interest rates, market integration and inflations, and their effect on the stock returns are discussed in greater detail in the sections below. It is also important to note that in four countries (Argentina, Brazil, Chile and the Philippines) none of the variables could explain the stock market fluctuations.

[14] C (Constant), FRP (Financial risk premium), FX (Foreign Exchange rate), INF (Inflation), MINT (Market integration), II (Institutional Investor's country ratings), USIR (U.S. interest rates).

5.4 Main determinants of stock market performance with stationary time series

In the previous section it has emerged that the first difference of three variables, namely the U.S. interest rates, inflation and market integration, explain the fluctuations of the stock markets in several emerging economies. The first difference of the Institutional Investor's country ratings is statistically significant only in Thailand and the first difference of the financial risk premium can explain the variance in the total returns on the Colombian stock market. While the Institutional Investor's country ratings and financial risk premiums will be given more attention in the next chapters, in the following sections the role of the U.S. interest rates, inflation and market integration in the emerging equity markets will be diseussed in greater detail.

5.4.1 U.S. interest rates

The U.S. intcrest rates were steadily declining throughout the sample period being as high as 10.6% in 1985 and falling down as low as 4% in 2003. It is believed that when the U.S. interest rates are low it becomes more attractive for foreign investors to invest abroad (Chuchan et al, 1998). The borrowing becomes cheaper and interest income is less attractive. At the same time high yields in emerging markets look more lucrative. Also low U.S. interest rates make borrowing for emerging markets less expensive and substantially improve their creditworthiness reducing the risk of default and brightening the economic prospects in these countries.

According to these views the U.S. interest rate (USIR) are expected to have a negative sign, which would mean that lower U.S. rates indirectly would lead to higher stock market returns (see Abugri, 2006). The first difference of the U.S. interest rates in the environment of the falling interest rates should have a positive sign. This means that negative changes in the U.S. interest rates should lead to higher total returns in the emerging markets. This proves to be

true in five countries, where the first difference of the U.S. interest rates is a statistically significant variable (with a positive sign) in explaining the behaviour of the stock markets. These countries are Brazil, Mexico, Indonesia, Malaysia and Thailand.

In four out of six Latin American countries (Argentina, Chile, Colombia and Venezuela) the U.S. interest rates have no explanatory power despite the geographical proximity and a leading economic and financial role of the U.S. in the region. They are statistically significant in explaining the stock market returns only in Brazil and Mexico. On the other hand, the U.S. interest rates are a powerful explanatory variable in three out of four Asian Pacific economies in the sample, namely Indonesia, Malaysia and Thailand. Only in the Philippines the coefficient of the U.S. interest rates is not statistically significant in explaining the stock market returns. When the regression analysis is performed with annual data the U.S. interest rates have explanatory power only Indonesia and the Philippines and the coefficients have a positive sign.

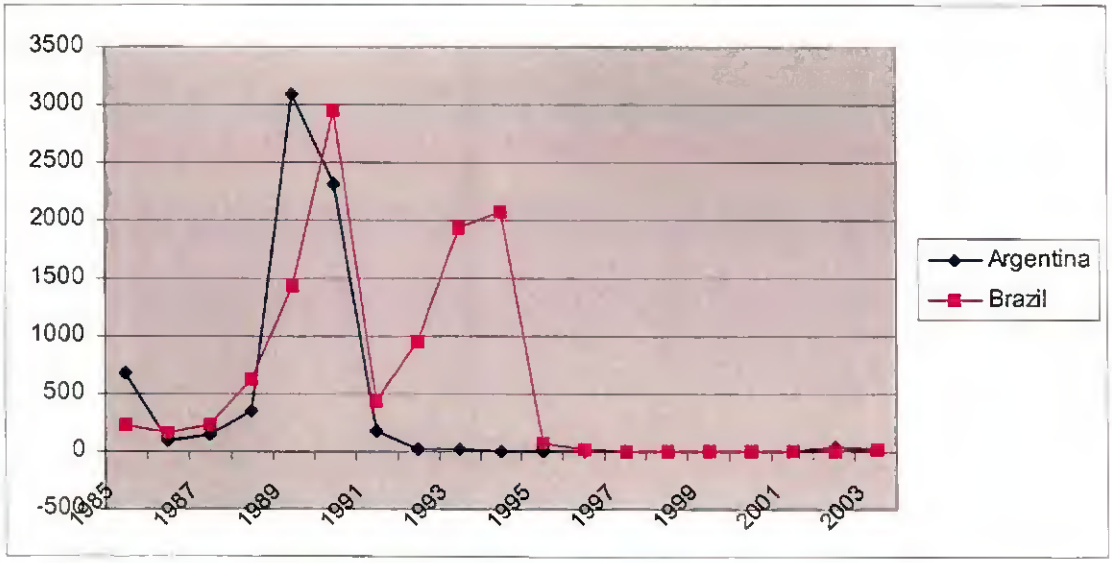
5.4.2 Inflation

The difference between inflation rates in Latin America and Asia Pacific is striking. The average inflation in the Latin American countries over the sample period was 175% in comparison to a tiny 6% in the Asian Pacific countries (See Table 23, p.105). While in Brazil the average inflation rate was 585% and in Argentina 362%, Malaysia enjoyed the inflation rate of 2.6% and Thailand of only 3.7%. Even among Latin American countries it is hardly possible to compare Brazil and Argentina with their hyperinflation periods in the late 80s and early 90s with the rest of the Latin American countries (See Graph 3, p.105).

Table 23. Descriprive statistic for inflation rates in Latin America and Asia

	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Argentina	3080.98	-1.17	3079.81	362.2534	848.92852	720679.630
Brazil	2944.54	3.20	2947.73	585.8494	877.49676	770000.559
Chile	26.97	2.49	29.46	12.2092	8.44353	71.293
Colombia	24.05	6.35	30.39	19.6341	7.78077	60.540
Mexico	127.28	4.55	131.83	33.6564	37.42099	1400.331
Venezuela	88.49	11.38	99.88	37.9826	24.04143	577.990
Latin America	1048.72	4.47	1053.18	175.26	300.69	248798.39
Malaysia	4.98	.29	5.27	2.5885	1.45435	2.115
Indonesia	54.67	3.72	58.39	11.2340	11.95792	142.992
Thailand	7.77	.30	8.07	3.7567	2.18192	4.761
Philippines	23.54	-.32	23.22	8.2777	5.62325	31.621
Asia	22.74	1.00	23.74	6.46	5.30	45.37

Graph 3. Comparison of the hyperinflation periods in Brazil and Argentina

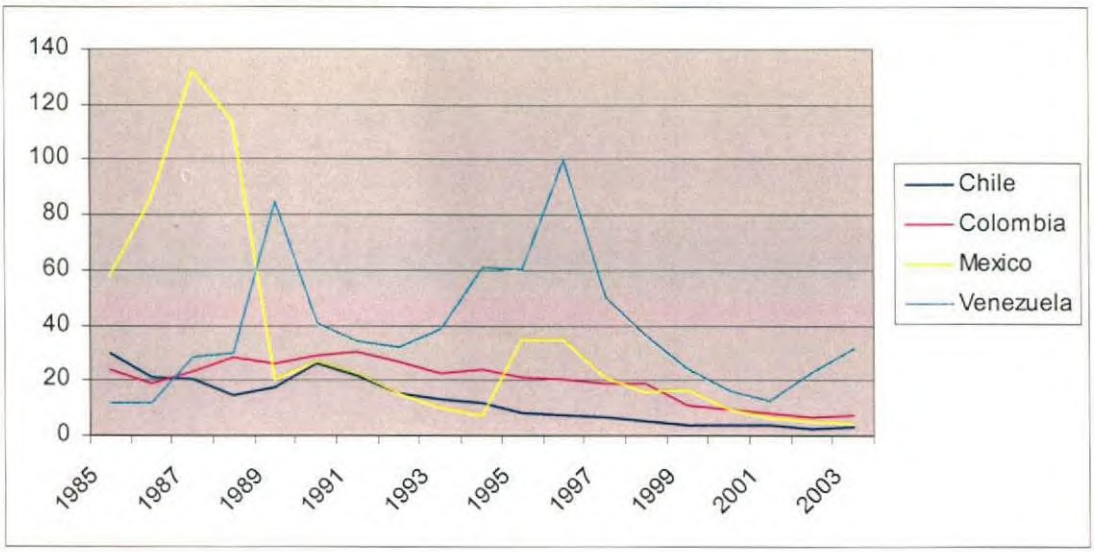


In Argentina the inflation rate reached 3079% in 1989 and went down to 2313% in 1990 and then subsequently decreased as the government was implementing anti-inflationary measures. In Brazil the first peak of hyperinflation was in 1990 reaching 2947% and then decreased to 451% in 1991. During the next three years it was again picking up reaching a new height of 2075% in 1994. In both countries the government was successful in capping the inflationary pressures in late 1990s with Argentina even running into periods of deflation in 1999-2001.

From 2002 the inflation rate started to rise in both countries reaching a new peak in 2004 (please note that 2004 is beyond the sample period).

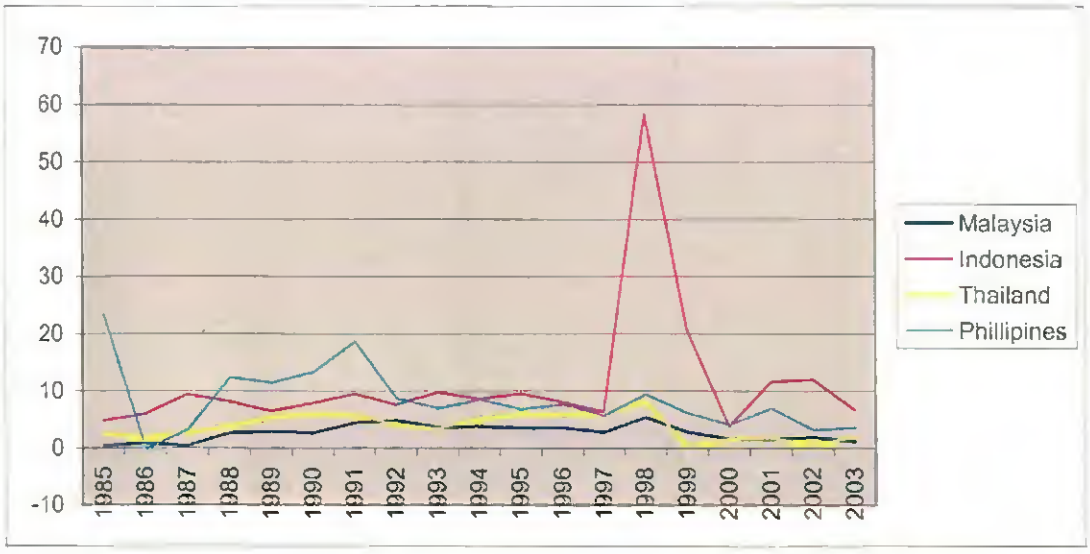
Mexico and Venezuela also experienced highly volatile inflation rates, but on a much lower scale in comparison to Brazil and Argentina (See Graph 4). Chile and Colombia had less volatile inflation rates during the sample period with the average inflation rates of 12% and 19% respectively.

Graph 4. Comparison of inflation rates in 4 Latin American countries



The Asian Pacific countries enjoyed relatively low inflation rates in the whole region. Only Indonesia had a short period of high inflation rates in 1998-99 reaching 55% in 1999 and decreasing to 20% in the following year. Malaysia and Thailand are the only countries in the whole sample with the least volatile inflation rates and average inflation of 2.6% and 3.7% respectively (See Graph 5, p.107).

Graph 5. Comparison of inflation rates in Asian Pacific countries



Inflation rates and to be more precise, the fisrt difference of inflation rates, proved to be a significant variable in explaining the stock market returns in Colombia, Malaysia and Thailand. In all three countries the coefficients of the first difference of inflation rates have a negative sign. This means that in countries with falling inflation rates, total returns are expected to rise. With rising inflation rates, the returns are expected to decline. In Colombia and Malaysia the inflation rates were falling during the period under consideration, and only in Thailand the inflation rates were rising.

These results coincide with the majority of the previous studies, which show that the relationship between inflation and expected returns is negative (Erb et al, 1995; Cutler et al, 1989; Gultekin, 1983). Boudoukh and Richardson (1993) argue that inflation and stock returns are positively correlated only in long term, but not in short term. However, according to the Fisher hypothesis, the higher rate of inflation should be reflected in higher rate of expected returns. Therefore the relationship between inflation and total returns should be positive. Another explanation of a positive relation between inflation and total returns is that inflation can be perceived as a risk factor in emerging markets and consequently being priced. However, the evidence of a positive relationship was not found.

It is interesting that inflation rates explain the fluctuations in the equity returns in the markets with the most stable and lowest average inflation rates in the whole sample. The average annual inflation rate was 2.5% in Malaysia, 3.7% in Thailand and 19.65% in Colombia (Colombia can be compared to the average of 1048% across the Latin American countries). When the analysis is repeated with annual data, inflation can explain the fluctuation of the stock returns only in Argentina.

5.4.3 Market integration

The trade sector (i.e. exports plus imports) as a proportion of GDP is used as a proxy of market integration. The increased market integration (MINT) in emerging markets should theoretically lead to lower total returns and lower diversification benefits. This is because when economies become more integrated with the world markets, the presence and participation of an increasing number of foreign investors make these economies more transparent, more informationally efficient and regulated.

Table 24 (p.109) compares the levels of market integration in Latin America and Asia Pacific. It appears that average market integration is considerably higher in four Asian Pacific countries (0.97) in comparison to six Latin American countries (0.38). In Asia among four export-oriented economies Malaysia has the highest level of market integration (1.7) and only Indonesia has considerably lower market integration in comparison to its neighbours. In Latin America the least integrated economy is Argentina (0.21) and the highest average level of market integration is achieved by Chile (0.60).

Table 24. Market integration across the countries

	Average	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Argentina	0.2074	0.27	0.14	0.40	0.2074	0.07434	0.006
Brazil	0.1939	0.16	0.13	0.29	0.1939	0.04699	0.002
Chile	0.6025	0.16	0.52	0.68	0.6025	0.04607	0.002
Colombia	0.3527	0.17	0.26	0.43	0.3527	0.04352	0.002
Mexico	0.4665	0.40	0.24	0.64	0.4665	0.13747	0.019
Venezuela	0.4954	0.20	0.40	0.60	0.4954	0.06034	0.004
Latin America	**0.3864**	**0.23**	**0.28**	**0.51**	**0.3864**	**0.06812**	**0.006**
Indonesia	0.5506	0.56	0.40	0.96	0.5506	0.12827	0.016
Malaysia	1.6963	1.26	1.03	2.29	1.6963	0.40784	0.166
Philippines	0.7866	0.65	0.46	1.11	0.7866	0.22911	0.052
Thailand	0.8749	0.76	0.49	1.25	0.8749	0.24467	0.060
Asia	**0.9771**	**0.81**	**0.60**	**1.40**	**0.9771**	**0.25247**	**0.074**

As mentioned above, theoretically market integration should decrease the expected returns. It is also supported by empirical results. For example, Bekaert and Harvey (2002) find a sharp drop in average market returns in twenty emerging markets. Therefore, the level of market integration is expected to have a negative sign. Moreover, taking into account that market integration was increasing in most of the emerging markets, the first difference of the market integration should be negative, indicating that positive differences in market integration should lead to lower returns.

The first difference of the market integration has a negative sign in Mexico, Indonesia and Colombia, where it has some explanatory power to explain the total returns. It means that while these markets were integrating with the wider financial world, their stock markets became more efficient and regulated, which consequently led to lower overall returns. When annual data is used in the analysis market integration is not statistically significant in explaining the stock market performance across the sample.

5.4.4 Concluding remarks

Analysing the results, presented in this chapter, it is important to note that the variables, which proved to be significant in explaining the stock market fluctuations, might not be the best measures of risks borne by emerging markets. As mentioned previously, the falling U.S. interest rates make emerging markets more attractive to the international investors and encourage capital inflows. But in this case their role to explain underlying risks might be limited. On the other hand, lower U.S. interest rates make borrowing for emerging markets less expensive and substantially improve their creditworthiness reducing the risk of default. In this case, the U.S. interest rates may have an effect on the risk composition in emerging markets. However, it would be expected that this risk would be best captured by financial risk premiums, derived from country default risk.

So, the question remains open whether the falling U.S. interest rates have only stimulated new capital inflows, improved considerably liquidity and driven the stock prices up, or they have improved the creditworthiness of these markets reducing the risk of default. It also might be a combination of both. However, considering that the U.S. interest rates can explain stock market fluctuations only in two Latin American countries (Mexico and Venezuela), in the region with high country default risk, and in three Asian markets (Indonesia, Malaysia and Thailand), in the region with considerably lower country default risk as reflected in the country ratings and financial risk premiums, the U.S. interest rates might not be the best measure of the country default risk and might be only indicative of increased (decreased) capital inflows (outflows).

It is also important to note that inflation rates explain the fluctuations in the equity returns in the markets with the most stable and lowest average inflation rates in the whole sample. The average annual inflation rate was 2.5% in Malaysia, 3.7% in Thailand and 19.65% in Colombia. Market integration is a significant variable in explaining the behaviour of the stock markets only in Colombia, Mexico and Indonesia. These results, although encouraging, do

not fully answer the question of what market fundamentals and underlying risks affect the stock markets in emerging economies and further analysis is undertaken in the following chapters.

5.5 Summary

In conclusion, strong evidence is found to show that the stock market returns in emerging markets support the widely accepted assumption that the equity returns exhibit high volatility. Among other characteristics are: the non-normality of the stock market returns, skewness and kurtosis, and the strong positive correlations among individual countries and the two regions, i.e. Latin America and Asia Pacific. This chapter has also presented a country-by-country analysis of the main determinants of the stock market performance in ten emerging economies. The results shows that the main determinants of the emerging stock markets are the U.S. interest rates. The U.S. interest rates can explain the variance of the equity returns in two Latin American countries (Mexico and Venezuela) and three Asian markets (Indonesia, Malaysia and Thailand). Market integration and inflation also play a significant role. The Institutional Investor's country ratings and financial risk premium are significant only in two markets (in Thailand and Colombia respectively). The effect of the U.S. interest rates, inflation and market integration are discussed in greater detail in this chapter. The role of other determinants will be discussed in the following chapters.

CHAPTER 6

Non-stationary time series

6.1 Introduction

Chapter 6 discusses the results using non-stationary time series. Section 6.2 outlines the main challenges and stages of the analysis with non-stationary time series. Section 6.3 guides through the findings of the country-by-country analysis and presents the results of the factor analysis and model selection at the end of the section. Section 6.4 summarises the findings of the chapter.

6.2 Non-stationary time series

As already known from the previous chapter, most of the explanatory variables, used in this research, are non-stationary. One of the reasons of the non-stationarity might be that most of these markets have been developing for the past two-three decades and the time series exhibit a cetain development pattern. This also indicates that these time series do not revert to their means over time and thus, the past performance has no predictive power. Although the results, obtained when using nonstationary time series, are valid within the time period under consideration (Gujarati, 2003), it is worthwhile to undertake this analysis as it gives some interesting findings and better understanding of what really drives the emerging markets. It is also worthwhile to undertake this analysis because, as already mentioned in Chapter 5, transforming the data (i.e. taking the first differences), might have resulted in information loss and the original relationships between variables would be more difficult to detect.

Moreover, a recent paper by Chanwit (2006) questions the stationarity of equity returns in emerging markets and re-examines the univariate propety of the returns on the stock markets. He argues that the majority of the stock returns in emerging markets can be more appropriately regarded as $I(1)$ or non-stationary. This view is also supported by the

Augmented Engle-Granger cointegration tests, performed to test the stationarity of the residuals, which showed that total returns and other non-stationary time-series are cointegrated.

There are a few obstacles, however, when using the levels of the explanatory variables in this research. First of all, most of the explanatory variables at the level are highly correlated with each other with most correlations attached to the financial risk primiums and the Institutional Investor's country ratings[15]. In order to find out what is the best determinants of the stock market performance in the countries under consideration, the following procedures are followed:

- a separate regression analysis is performed for every individual variable to find out whether it can explain any variance in the total stock market returns on its own;
- time series up to the second lag are considered as lags are potentially possible when using qurterly data;
- correlation analysis is carried out to identify highly correlated time series;
- the factor analysis is then used to identify and abandon the redundant variables;
- and finally, the Akaike Information and Schwarz Bayesian criteria are used to identify the model with the best fit and verify the choice of the variables, made using the factor analysis.

All these steps of the analysis are performed for each country to identify variables, which best explain the fluctuations of the emerging stock markets within the period under consideration. The full regression and test statistic is given only for variables, which coefficients are found to be statistically significant. Apart from the autocorrelation and heteroscedasticity tests, the residuals of all regressions are tested for a unit root. The fact that all residual have been found stationary adds more credability to the results.

[15] The role of the financial risk premiums and country ratings will be discussed in more details in Chapter 7.

6.3 Empirical results with non-stationary time series

As discussed above several steps of the analysis will be performed to identify the most important variables, which can account for the most variation in the total returns on the stock markets in emerging economies. Below the detailed description of each step is described.

6.3.1 Argentina

Table 25 shows that the following variables are statistically significant individually in explaining the variance of the stock market returns in Argentina: financial risk premiums (FRP), the second lag of inflation (INF(-2)) and the Institutional Investor's country ratings (II). FRP and II have the predicted signs. INF(-2) has a positive sign (the signs of coefficients of inflation rates are discussed in the previous chapter).

Table 25. Regression results for Argentina

Regressor	Intercept	T-Ratio[Prob]	Coefficient[1]	T-Ratio[Prob]	R-Bar-Squared	DW statistic[2]	Stationarity of residuals[3]	Heteroscedasticity CHSQ
FRP	-0.33674*[3]	-1.8534[.068]	0.90839**	2.4553[.016]	0.06363	2.152*	-9.569***	12.7657[.000]
FRP(-1)	-0.2683	-1.4852[.142]	0.7584**	2.0785[.041]	0.042938	2.1088*	-9.249***	8.4613[.004]
FRP(-2)			0.44668	1.2016[.233]				
FX			-6.32E-02	-1.0770[.285]				
FX(-1)			-5.86E-02	-.97032[.335]				
FX(-2)			-3.99E-02	-.63514[.527]				
INF			3.76E-04	1.5399[.128]				
INF(-1)			3.99E-04	1.6363[.106]				
INF(-2)	0.051815	.93931[.351]	5.03E-04**	2.0857[.041]	0.043879	2.0239*	-8.530***	10.6275[.001]
MINT			-1.4793	-.52278[.603]				
MINT(-1)			-1.9461	-.65868[.512]				
MINT(-2)			-1.1015	-.35362[.725]				
II	0.36404**	2.1860[.032]	-0.0090812*	-1.7118[.091]	0.02542	2.1189*	-9.191***	2.2081[.137]
II(-1)	0.39324**	2.3352[.022]	-0.010024*	-1.8720[.065]	0.032736	2.1157*	-9.184***	2.0896[.148]
II(-2)	0.43062**	2.5080[.014]	-0.010988**	-2.0233[.047]	0.040655	2.1572*	-9.119***	1.7967[.180]
USIR			4.743	1.5017[.137]				
USIR(-1)			4.8366	1.5959[.115]				
USIR(-2)			7.0486	2.3310[.023]				

[1]***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

[2]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641; for k'=75 d_L=1.598, d_U=1.652

[3]The 99%, 95% and 90% critical values for the ADF unit root test are -3.546, –2.911 and -2.590 respectively. *** indicates 1% significance level and strong evidence against the null hypothesis that the time series has a unit root.

The correlation analysis in Table 26 shows that all four variables are highly correlated with the financial risk premiums.

Table 26. Correlations matrix

	FRP	INF(-2)	II
FRP	1		
INF(-2)	.660(**)	1	
II	-.773(**)	-.467(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

In order to identify variables, which best explain the variance in the total returns, and to exclude redundant variables, the factor analysis is used. The results are presented in Tables 27.1-27.3 below.

Table 27.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.610
Bartlett's Test of Sphericity	Approx. Chi-Square	109.284
	Df	3
	Sig.	.000

Table 27.2 Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.282	76.077	76.077	2.282	76.077	76.077
2	.544	18.147	94.223			
3	.173	5.777	100.000			

Extraction Method: Principal Component Analysis.

Table 27.3 Component Matrix

	Component
	1
FRP	.942
II	-.868
INF(-2)	.801

Extraction Method: Principal Component Analysis
1 components extracted

The high value of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (61%) and the Bartlett's test of sphericity at 1% significance level in Table 27.1 indicate that the factor analysis is useful and its results are meaningful with this set of variables. The principal component analysis in Table 27.2 shows that only one component with the Eigenvalue greater than 1 has been extracted. The component matrix in Table 27.3 shows that this component is highly correlated with the financial risk premium (FRP) indicating that FRP accounts for 76% of the variance in the four original variables and can replace them with 24% of information loss.

To check the robustness of the results of the factor analysis, the model selection with the help of the Akaike Information Criterion is used. The Schwarz Bayesian Criterion is also reported for comparison. Table 28 shows the Akaike Information Criteria for four models with different combinations of the explanatory variables. The Akaike Information Criterion (the lowest or more negative) shows that the best model is Model 4, which coincides with the results of the factor analysis. The Schwarz Bayesian Criterion on the contrary shows that Model 1 should be chosen.

Table 28. Model selection for Argentina

Regressor	Model 1	Model 2	Model 3	Model 4
C	-.70270	(-0.38972)*	-.73854	(-0.33674)*
FRP	1.3585*	1.0267**	1.4361**	0.90839**
INF(-2)	.6296E-4	8.46E-05		
II	.0053226		.0055016	
R-Bar-Squared	.075173	0.082973	.087687	0.06363
S.E. of Regression	.42640	0.42459	.42350	0.42924
F-stat.	2.9779[.037]	4.3025[.017]	4.5082[.014]	6.0286[.016]
Residual Sum of Squares	12.7269	12.7998	12.7340	13.4503
Equation Log-likelihood	-39.8686	-40.0801	-39.8894	-41.9772
Akaike Info. Criterion	-43.8686	-43.0801	-42.8894	-43.9772
Schwarz Bayesian Criterion	-48.4768	-46.5362	-46.3455	-46.2947

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

6.3.2 Brazil

In Brazil the second lag of the financial risk premium (FRP(-2)) and the Institutional Investor's country ratings (II) are statistically significant in explaining the behaviour of the stock market returns (See Table 29). The coefficients of FRP(-2) and II have expected signs.

Table 29. Regression results for Brazil

Regressor	Intercept	T-Ratio[Prob]	Coefficient[1]	T-Ratio[Prob]	R-Bar-Squared	DW statistic[2]	Stationarity of residuals[3]	Heteroscedasticity CHSQ
FRP			0.12994	.57942[.564]				
FRP(-1)			0.15427	.66140[.510]				
FRP(-2)	-0.03247	-.50225[.617]	0.43075*	1.8113[.074]	0.030297	2.0825*	-9.059***	2.6282[.105]
FX			-2.30E-02	-.72828[.469]				
FX(-1)			-2.40E-02	-.74691[.458]				
FX(-2)			-9.07E-03	-.27409[.785]				
INF			2.63E-05	.67762[.500]				
INF(-1)			4.47E-06	.11454[.909]				
INF(-2)			1.50E-05	.38233[.703]				
MINT			2.89E-01	.099480[.921]				
MINT(-1)			0.4541	.15133[.880]				
MINT(-2)			0.93844	.30247[.763]				
II	0.41285**	1.9701[.053]	-0.010353*	-1.6846[.096]	0.024232	2.224*	-9.674***	3.0347[.082]
II(-1)			-0.010108	-1.6422[.105]				
II(-2)			-0.009496	-1.5388[.128]				
USIR			2.7048	1.3148[.193]				
USIR(-1)			1.5244	.76484[.447]				
USIR(-2)			2.7699	1.3792[.172]				

[1]***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

[2]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641; for k'=75 d_L=1.598, d_U=1.652

[3]The 99%, 95% and 90% critical values for the ADF unit root test are -3.546, –2.911 and -2.590 respectively. *** indicates 1% significance level and strong evidence against the null hypothesis that the time series has a unit root.

The correlation analysis in Table 30 (p.118) shows that the second lag of financial risk premium (FRP(-2)) is highly correlated with the Institutional Investor's country ratings (II). As there are only two competing variables, it is not sensible to perform the factor analysis and the choice between the variables will be made with the help of the model selection criteria.

Table 30. Correlations matrix

	FRP(-2)	II
FRP(-2)	1	
II	-.736(**)	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The model selection results are reported in Table 31. Both Akaike Information and Schwarz Bayesian Criteria show that Model 1 is the best model. However, because the financial risk premium is highly correlated with the Institutional Investor's country ratings, both variables are not significant. The second best model is Model 3 with the Institutional Investor's country ratings.

Table 31. Model selection for Brazil

Regressor	Model 1	Model 2	Model 3
C	0.18692	-0.032472	0.41285*
FRP(-2)	0.27562	0.43075*	
II	-0.0054327		(-0.010353)*
R-Bar-Squared	0.021565	0.030297	0.024232
S.E. of Regression	0.28455	0.28328	0.28441
F-stat.	1.8045[.172]	3.2807[.074]	2.8377[.096]
Residual Sum of Squares	5.7489	5.7779	5.9051
Equation Log-likelihood	-10.4644	-10.6502	-11.1074
Akaike Info. Criterion	**-13.4644**	-12.6502	**-13.1074**
Schwarz Bayesian Criterion	**-16.9205**	-14.9543	-15.4249

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

6.3.3 Chile

The following variables are statistically significant in explaining the variance in the stock market returns in Chile as shown in Table 32 (p.119): the financial risk premium (FRP), foreign exchange rates (FX), inflation (INF), the Institutional Investor's country ratings (II), and the U.S. interest rates (USIR). The coefficients of FRP(-2), FX, USIR and II have expected signs. The coefficient of inflation (INF) has a positive sign.

Table 32. Regression results for Chile

Regressor	Intercept	T-Ratio[Prob]	Coefficient[1]	T-Ratio[Prob]	R-Bar-Squared	DW statistic[2]	Stationarity of residuals[3]	Heteroscedasticity CHSQ
FRP	-0.0394	-.83701[.405]	0.66363	2.5269[.014]	0.067834	2.0776*	-8.857***	.63537[.425]
FRP(-1)	-0.048	-.99636[.322]	0.7001	2.6550[.010]	0.075569	2.1221*	-9.063***	.65166[.420]
FRP(-2)	-0.0749	-1.5336[.130]	0.84875	3.1932[.002]	0.11188	2.1371*	-9.083***	1.2952[.255]
FX	0.1914	3.7083[.000]	-2.93E-04	-2.4906[.015]	0.065693	2.0749*	-8.833***	.84791[.357]
FX(-1)	0.1862	3.6778[.000]	-2.85E-04	-2.4368[.017]	0.062554	2.032*	-8.640***	.81782[.366]
FX(-2)	0.1674	3.2089[.002]	-2.41E-04	-1.9851[.051]	0.038722	2.0365*	-8.593***	1.0724[.300]
INF	-0.0132	-.42128[.675]	2.81E-02	3.2289[.002]	0.11298	2.1309*	-9.137***	.76841[.381]
INF(-1)	-0.0048	-.15276[.879	2.46E-02	2.8463[.006]	0.087564	2.1695*	-9.302***	1.0402[.308]
INF(-2)	-0.015	-.46728[.642]	2.75E-02	3.1738[.002]	0.11054	2.1812*	-9.306***	1.9414[.164]
MINT			-9.12E-01	-.54559[.587]				
MINT(-1)			-0.4728	-.28012[.780]				
MINT(-2)			0.39213	.22534[.822]				
II	0.2467	4.2377[.000]	-0.0036223	-3.1659[.002]	0.10868	2.1711*	-9.295***	2.2254[.136]
II(-1)	0.243	4.2610[.000]	-0.0036027	-3.1736[.002]	0.10921	2.1636*	-9.258***	2.2760[.131]
II(-2)	0.241	4.1709[.000]	-0.0035807	-3.1021[.003]	0.10564	2.1626*	-9.186***	2.3532[.125]
USIR	-0.129	-1.6687[.099]	2.9407	2.6562[.010]	0.075643	2.0507*	-8.756***	.67369[.412]
USIR(-1)	-0.089	-1.1682[.247]	2.3269	2.1529[.035]	0.04682	2.0361*	-8.680***	.36110[.548]
USIR(-2)	-0.070	-.88328[.380]	2.0313	1.8194[.073]	0.030675	2.02*	-8.535***	.42909[.512]

[1]***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

[2]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641; for k'=75 d_L=1.598, d_U=1.652

[3]The 99%, 95% and 90% critical values for the ADF unit root test are -3.546, –2.911 and -2.590 respectively. *** indicates 1% significance level and strong evidence against the null hypothesis that the time series has a unit root.

The correlation analysis in Table 33 shows that all variables under consideration are highly correlated with each other.

Table 33. Correlations matrix

	FRP	FX	INF	II	USIR
FRP	1				
FX	-.880(**)	1			
INF	.855(**)	-.848(**)	1		
II	-.966(**)	.898(**)	-.903(**)	1	
USIR	.824(**)	-.888(**)	.869(**)	-.864(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

In order to reduce the number of correlated variables and drop the redundant ones, the factor analysis is performed and the results are presented in Tables 34.1 to 34.3 (p.120).

Table 34.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.878
Bartlett's Test of Sphericity	Approx. Chi-Square	553.981
	df	10
	Sig.	0.000

Table 34.2 Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.523	90.462	90.462	4.523	90.462	90.462
2	.200	4.005	94.467			
3	.152	3.032	97.499			
4	.083	1.657	99.155			
5	.042	.845	100.000			

Extraction Method: Principal Component Analysis.

Table 34.3 Component Matrix

	Component
	1
FRP	.954
FX	-.949
INF	.945
II	-.972
USR	.934

*Extraction Method: Principal Component Analysis
**1 component extracted

The high value of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (88%) and the Bartlett's test of sphericity at lower than 5% significance level in Table 34.1 indicate that the factor analysis is useful and its results are meaningful with this set of variables. There is only one component extracted which accounts for 90% of variance in all the variables (See Table 34.2). Table 34.3 shows that this only component is highly correlated with the Institutional Investor's country ratings (-0.972). It is important to note that the second choice could be the financial risk premium (FRP) with the correlation coefficient of 0.954.

The results of the principal component analysis indicate that II or alternatively FRP can be used instead of four other variables, perfectly replacing them with only 10% loss of

information. II and FRP individually explain 11% and 6% of the variation in the quarterly returns on the stock market in Chile respectively.

In order to find out which of these two variables has a better fit, the model selection is used and the results are presented below in Table 35. Both Akaike Information Criterion and Schwarz Bayesian Criterion chose Model 1 with all the explanatory variables and it is already known that all these variables are highly correlated, thus the model might have spurious results. The attention should be given to Model 2 and 3 with two rival variables, i.e. the financial risk premiums and Institutional Investor's country ratings. It appears that both model selection criteria give the preference to Model 2 with the financial risk premium.

Another way of using the factor analysis is to extract factors, which will best represent the correlated variables. Here it is tested whether the extracted factor performs better in comparison to the authentic variables, which are most correlated with the principal component extracted. Both Akaike Information and Schwarz Bayesian criteria show that the extracted factor does not outperform the authentic variables.

Table 35. Model selection for Chile

Regressor	Model 1	Model 2	Model 3	Model 4
C	.57443	-.039498	0.2514***	0.070541***
FRP	-1.2177	.66363**		
II	-.0076268		(-0.0037067)***	
FX	.1113E-3			
INF	.023601			
USIR	-.70290			
Extracted FACTOR				0.056359***
R-Bar-Squared	.10013	.067834	0.11023	0.11043
S.E. of Regression	.15214	.15484	0.15229	0.1518
F-stat.	2.6467[.030]	6.3850[.014]	10.0440[.002]	10.0625[.002]
Residual Sum of Squares	1.5970	1.7503	1.6698	1.6591
Equation Log-likelihood	37.9295	34.4942	35.2793	33.5166
Akaike Info. Criterion	**31.9295**	**32.4942**	33.2793	33.5166
Schwarz Bayesian Criterion	**24.9771**	30.1767	30.9752	31.2125

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

6.3.4 Colombia

Table 36 shows that in Colombia the following variables are statistically significant in explaining the behaviour of the stock market: financial risk premium (FRP), the first lag of inflation (INF(-1)), and the Institutional Investor' country ratings (II). The coefficients of FRP and II have expected signs. The coefficient of INF(-1) has a positive sign.

Table 36. Regression results for Colombia

Regressor	Intercept	T-Ratio[Prob]	Coefficient[1]	T-Ratio[Prob]	R-Bar-Squared	DW statistic[2]	Stationarity of residuals[3]	Heteroscedasticity CHSQ
FRP	-0.14326	-1.2230[.225]	0.64947	1.7831[.079]	0.028608	2.0059*	-8.532***	.51062[.475]
FRP(-1)	-0.2286	-1.9431[.056]	0.91516	2.5167[.014]	0.067232	2.0122*	-8.559***	2.3907[.122]
FRP(-2)	-0.25591	-2.1272[.037]	0.99918	2.6983[.009]	0.079225	2.0558*	-8.739***	1.3200[.251]
FX			-4.62E-05	-1.4268[.158]				
FX(-1)			-4.68E-05	-1.4174[.161]				
FX(-2)			-4.28E-05	-1.2420[.218]				
INF			1.98E-02	1.4141[.162]				
INF(-1)	-0.057464	-.76614[.446]	2.38E-02	1.6772[.098]	0.023913	1.9401*	-8.249***	3.8153[.051]
INF(-2)			2.38E-02	1.6322[.107]				
MINT			-2.08E-10	-1.4417[.154]				
MINT(-1)			-2.07E-10	-1.3724[.174]				
MINT(-2)			-2.06E-10	-1.2846[.203]				
II	0.65963	2.5095[.014]	-0.014705	-2.2917[.025]	0.054338	2.0059*	-8.517***	.71631[.397]
II(-1)	0.68792	2.6108[.011]	-0.015381	-2.3940[.019]	0.060095	2.0381*	-8.517***	1.0353[.309]
II(-2)	0.73576	2.7744[.007]	-0.016516	-2.5570[.013]	0.070518	2.0671*	-8.757***	3.0118[.083]
USIR			1.4746	.88219[.381]				
USIR(-1)			0.83719	.51918[.605]				
USIR(-2)			1.0928	.66248[.510]				

[1]***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

[2]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641; for k'=75 d_L=1.598, d_U=1.652

[3]The 99%, 95% and 90% critical values for the ADF unit root test are -3.546, –2.911 and -2.590 respectively. *** indicates 1% significance level and strong evidence against the null hypothesis that the time series has a unit root.

The correlation analysis in Table 37 shows that FRP(-2) is highly correlated with INF(-1) and II(-2).

Table 37. Correlations matrix

	FRP	INF	II
FRP	1		
INF	.752(**)	1	
II	-.707(**)	-.422(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

In order to eliminate the redundant variables from this set of variables, the factor analysis is used. The results of the factor analysis are presented in Table 38.1 to 38.3 below.

Table 38.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.528
Bartlett's Test of Sphericity	Approx. Chi-Square	135.039
	Df	6
	Sig.	.000

Table 38.2 Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.151	71.684	71.684	2.151	71.684	71.684
2	.678	22.608	94.292			
3	.171	5.708	100.000			

*Extraction Method: Principal Component Analysis

Table 38.3 Component Matrix

	Component
	1
FRP	.948
INF(-1)	.822
II	-.760

*Extraction Method: Principal Component Analysis
**1 component extracted

Although the value of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is not very high (53%), the Bartlett's test of sphericity is at 1% significance level indicating that the factor analysis might be useful (See Table 38.1). The cumulative percentage of the variance explained by the extracted component is around 72%. This means that using one variable instead of four original variables will leave the model with only 28% information loss (See Table 38.2). The component matrix in Table 38.3 shows that financial risk premium (FRP) is most correlated with the component extracted. The financial risk premium explains 3% of the variance in the total returns in Colombia. Table 36 also shows that when the financial risk

premium is lagged by one or two quarters the results improve (FRP(-1) explains 6% and FRP(-2) 7% of the variance in total returns).

In Table 39 both Akaike Information and Schwarz Bayesian criteria show that Model 4 with the financial risk premium has the best fit. The results coincide with the factor analysis results.

Table 39. Model selection for Colombia

Regressor	Model 1	Model 2	Model 3	Model 4
C	0.64543	.48305	0.65993**	-.14695
FRP	-0.28754	0.22726		0.66552*
II	-0.014761	-0.012097	-0.014694**	
INF(-1)	0.021530			
R-Bar-Squared	0.043734	0.043844	0.054117	0.030123
S.E. of Regression	0.22731	0.22875	0.22752	0.23039
F-stat.	2.1281[.104]	2.6737[.076]	5.1766[.026]	3.2672[.075]
Residual Sum of Squares	3.6684	3.7152	3.7271	3.8216
Equation Log-likelihood	6.7443	5.6889	5.5711	4.6442
Akaike Info. Criterion	2.7443	2.6889	3.5711	**2.6442**
Schwarz Bayesian Criterion	1.8906	0.76717	1.2671	**0.34016**

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

6.3.5 Mexico

Table 40 (p.125) shows the variables, which have some power to explain the behaviour of the stock market in Mexico. They are financial risk premiums (FRP(-2)), foreign exchange rates (FX), inflation (INF), market integration (MINT), the Institutional Investor's country ratings (II), and the U.S. interest rates (USIR). The coefficients of FRP(-2), FX, MINT and II have expected signs. The coefficients of INF and USIR have positive signs.

Table 40. Regression results for Mexico

Regressor	Intercept	T-Ratio[Prob]	Coefficient[1]	T-Ratio[Prob]	R-Bar-Squared	DW statistic[2]	Stationarity of residuals[3]	Heteroscedasticity CHSQ
FRP	-0.010929	-.19111[.849]	0.33124	1.8160[.073]	0.030117	2.1941*	-9.378***	11.1924[.001]
FRP(-1)			0.29856	1.5711[.120]				
FRP(-2)	-0.047273	-.76084[.449]	0.45014	2.3043[.024]	0.055749	2.2187*	-9.446***	12.1536[.000]
FX	0.17535	3.4308[.001]	-1.72E-02	-2.2028[.031]	0.049482	2.241*	-9.645***	2.4461[.118]
FX(-1)	0.17659	3.5231[.001]	-1.79E-02	-2.2912[.025]	0.054306	2.2218*	-9.552***	2.6574[.103]
FX(-2)	0.16103	3.1433[.002]	-1.50E-02	-1.8590[.067]	0.032545	2.2316*	-9.537***	4.4800[.034]
INF	0.013586	.37437[.709]	7.98E-03	2.7202[.008]	0.079599	2.3308*	-10.067***	10.1011[.001]
INF(-1)	0.016868	.45690[.649]	7.43E-03	2.5115[.014]	0.066925	2.3076*	-9.944***	16.7073[.000]
INF(-2)	0.017357	.46176[.646]	7.40E-03	2.4742[.016]	0.065558	2.3096*	-9.900***	14.9398[.000]
MINT	0.31087	3.1094[.003]	-1.97E+00	-2.3979[.019]	0.060317	2.2174*	-9.547***	1.1321[.287]
MINT(-1)	0.25585	2.5771[.012]	-1.51E+00	-1.8424[.069]	0.031344	2.2171*	-9.520***	3.5661[.059]
MINT(-2)			-1.38E+00	-1.6555[.102]				
II	0.41336	3.2565[.002]	-0.0078353	-2.6862[.009]	0.077486	2.3081*	-9.941***	10.3320[.001]
II(-1)	0.38891	2.9993[.004]	-0.007305	-2.4352[.017]	0.062463	2.2924*	-9.858***	9.5066[.002]
II(-2)	0.39485	2.9759[.004]	-0.0074607	-2.4168[.018]	0.062192	2.2512*	-9.598***	7.4601[.006]
USIR	-0.14922	-1.2531[.214]	3.3736	1.9789[.052]	0.03791	2.1673*		3.3582[.067]
USIR(-1)			1.4068	.84021[.404]				
USIR(-2)			1.3977	.81506[.418]				

[1]***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

[2]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641; for k'=75 d_L=1.598, d_U=1.652

[3]The 99%, 95% and 90% critical values for the ADF unit root test are -3.546, –2.911 and -2.590 respectively. *** indicates 1% significance level and strong evidence against the null hypothesis that the time series has a unit root.

The correlation matrix in Table 41 shows that all the variables under consideration are highly correlated between each other.

Table 41. Correlations matrix

	FRP	FX	INF	MINT	II	USIR
FRP	1					
FX	-.801(**)	1				
INF	.689(**)	-.591(**)	1			
MINT	-.601(**)	.943(**)	-.494(**)	1		
II	-.891(**)	.793(**)	-.688(**)	.619(**)	1	
USIR	.770(**)	-.842(**)	.587(**)	-.733(**)	-.800(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

In order to choose the best variables and abandon the redundant variables, the factor analysis is used and its results are presented in Tables 42.1 to 42.3.

Table 42.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.769
Bartlett's Test of Sphericity	Approx. Chi-Square	580.820
	Df	15
	Sig.	.000

Table 42.2 Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.636	77.270	77.270	4.636	77.270	77.270
2	.662	11.040	88.310			
3	.377	6.277	94.587			
4	.204	3.406	97.993			
5	.108	1.798	99.791			
6	.013	.209	100.000			

*Extraction Method: Principal Component Analysis

Table 42.3 Component Matrix

	Component
	1
FRP	-.905
FX	.947
INF	-.757
MINT	.836
II	.913
USR	-.903

*Extraction Method: Principal Component Analysis
**1 component extracted

The high value of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (77%) and the Bartlett's test of sphericity at lower than 5% significance level indicate that the factor analysis is useful and its results are meaningful with this set of variables (See Table 42.1). There is only one component extracted, which is most correlated with foreign exchange rates (FX). Hence FX accounts for 77% of the variance in all seven variables under consideration and can replace them with only 23% of information loss.

To check the robustness of the factor analysis results, the model selection is performed and the results are reported in Table 43. Similar to other countries, considered above, both model selection criteria choose Model I with all explanatory variables. However, none of them are statistically significant. Different combinations of the variables have been considered and some of them are reported in Table 43. It appears that Model 5 with the financial risk premium is the model with the best fit according to the lowest Akaike Information Criterion.

Table 43. Model selection for Mexico

Regressor	Model 1	Model 2	Model 3	Model 4	Model 5	Model 5
C	1.1392*	1.1601***	1.1936***	.41336**	.17535***	-0.01093
FRP	-.085755	.099875				0.33124*
FX	.073416	.090020*	0.083752**		-.017162**	
INF	.0044022					
MINT	-6.6935	-7.8689**	(-7.4225)**			
II	-.014774**	-.016071**	(-0.016627)***	-.0078354**		
USR	-.96689					
R-Bar-Squared	.10386	.11496	0.12695	.077487	.049482	0.030117
S.E. of Regression	.22916	.22773	0.22619	.23250	.23601	0.2384
F-stat.	2.4293[.035]	3.4030[.013]	4.5867[.005]	7.2156[.009]	4.8523[.031]	3.2979[.073]
Residual Sum of Squares	3.5709	3.6304	3.6324	3.9463	4.0661	4.1489
Equation Log-likelihood	7.7549	7.1353	7.1149	4.0067	2.8852	2.1289
Akaike Info. Criterion	**0.75491**	2.1353	3.1149	2.0067	0.88521	**0.12892**
Schwarz Bayesian Criterion	-7.3563	-3.6584	-1.5201	2.3081	-1.4323	-2.1886

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

6.3.6 Venezuela

The only two variables, which have an explanatory power in Venezuela, are the first lag of market integration (MINT) and the second lag of Institutional Investor's country ratings (II) as shown in Table 44 (p.128). The coefficient of the Institutional Investor's country ratings (II) has an expected negative sign and the coefficient of market integration (MINT) has a positive sign.

Table 44. Regression results for Venezuela

Regressor	Intercept	T-Ratio[Prob]	Coefficient[1]	T-Ratio[Prob]	R-Bar-Squared	DW statistic[2]	Stationarity of residuals[3]	Heteroscedasticity CHSQ
FRP			0.26802	.60133[.549]				
FRP(-1)			0.18239	.41243[.681]				
FRP(-2)			0.24537	.55084[.583]				
FX			-5.48E-06	-.076938[.939]				
FX(-1)			1.84E-06	.024578[.980]				
FX(-2)			2.12E-05	.26463[.792]				
INF			1.52E-03	.27878[.781]				
INF(-1)			2.77E-03	.51201[.610]				
INF(-2)			4.15E-03	.76348[.448]				
MINT	-0.48235	-1.8195[.073]	4.33E+00	2.0421[.045]	0.04108	1.7119*	-7.351***	6.0987[.014]
MINT(-1)	-0.54514	-2.0988[.039]	4.85E+00	2.3281[.023]	0.056363	1.7131*	-7.358***	5.5867[.018]
MINT(-2)	-0.43454	-1.6412[.105]	3.96E+00	1.8621[.067]	0.032693	1.7325*	-7.376***	5.2981[.021]
II	1.0259	2.5971[.011]	-0.027647	-2.4646[.016]	0.064168	1.7292*	-7.413***	1.1808[.277]
II(-1)	1.1554	2.8695[.005]	-0.031249	-2.7400[.008]	0.080834	1.8158*	-7.746***	1.5679[.211]
II(-2)	1.3118	3.1672[.002]	-0.035622	-3.0428[.003]	0.10163	1.8081*	-7.665***	1.3804[.240]
USIR			1.8533	.93979[.350]				
USIR(-1)			0.84356	.44287[.659]				
USIR(-2)			0.82764	.42406[.673]				

[1]***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

[2]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641; for k'=75 d_L=1.598, d_U=1.652

[3]The 99%, 95% and 90% critical values for the ADF unit root test are -3.546, -2.911 and -2.590 respectively. *** indicates 1% significance level and strong evidence against the null hypothesis that the time series has a unit root.

The correlation matrix in Table 45 shows that MINT(-1) and II(-2) are highly correlated.

Table 45. Correlations matrix

	MINT(-1)	II(-2)
MINT(-1)	1	
II(-2)	-.365(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

Because there are only two statistically significant variables, it is not feasible to run the factor analysis. The Akaike Information Criterion in Table 46 (p.129) shows that Model 2 with the Institutional Investor's country ratings has a slightly better fit than Model 1, while the Schwarz Bayesian Criterion gives the preference to Model 1. In both models the Institutional Investor's country ratings is a statistically significant variable.

Table 46. Model selection for Venezuela

Regressor	Model 1	Model 2
C	0.70167	1.3118***
MINT(-1)	3.0986	
II(-2)	(-0.029224)**	(-0.035622)***
R-Bar-Squared	0.11361	0.10163
S.E. of Regression	0.26012	0.26188
F-stat.	5.6782[.005]	9.2586[.003]
Residual Sum of Squares	4.8042	4.9377
Equation Log-likelihood	-3.8221	-4.8361
Akaike Info. Criterion	-6.8221	-6.8361
Schwarz Bayesian Criterion	**-10.2782**	-9.1402

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

6.3.7 Indonesia

In Indonesia the following variables can explain the behaviour of the stock market: the second lag of financial risk premium (FRP(-2)), inflation (INF), market integration (MINT) and the second lag of the U.S. interest rates (USIR) (See Table 47). The coefficients of FRP(-2) and MINT have predicted signs. The coefficients of INF and USIR have negative signs.

Table 47. Regression results for Indonesia

Regressor	Intercept	T-Ratio[Prob]	Coefficient[1]	T-Ratio[Prob]	R-Bar-Squared	DW statistic[2]	Stationarity of residuals	Heteroscedasticity CHSQ
FRP			0.097203	.13512[.893]				
FRP(-1)			-0.017601	-.024558[.980]				
FRP(-2)	-0.094142	-.95324[.344]	1.2533	1.7794[.080]	0.033761	2.1581*	-8.389***	9.6134[.002]
FX			-9.83E-06	-.77570[.441]				
FX(-1)			-1.20E-05	-.94947[.346]				
FX(-2)			3.62E-06	.28308[.778]				
INF	0.14694	2.3971[.020]	-2.76E-02	-1.9688[.054]	0.044332	2.1096*	-8.187***	.85165[.356]
INF(-1)			8.54E-03	.59195[.556]				
INF(-2)			8.75E-03	.60567[.547]				
MINT	0.59843	2.9122[.005]	-3.72E+00	-2.6647[.010]	0.089582	2.2489*	-8.780***	.46214[.497]
MINT(-1)			-1.20E+00	-.82448[.413]				
MINT(-2)			-8.75E-01	-.60218[.549]				
II			-0.0042042	-1.0757[.286]				
II(-1)			-0.0054285	-1.3735[.175]				
II(-2)			-0.0022669	-.55600[.580]				
USIR			-1.9857	-.54747[.586]				
USIR(-1)			-5.0404	-1.4256[.160]				
USIR(-2)	0.40788	1.8093[.076]	-6.1088	-1.7305[.089]	0.035621	2.1861*	-8.174***	.14381[.705]

[1]***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

[2]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641; for k'=75 d_L=1.598, d_U=1.652

The correlation analysis in Table 48 shows that FRP(-2) is correlated only with USIR(-2). However USIR(-2) is correlated with all three variables.

Table 48. Correlations matrix

	FRP(-2)	INF	MINT	USIR(-2)
FRP(-2)	1			
INF	.197	1		
MINT	-.131	.803(**)	1	
USIR(-2)	.514(**)	-.268(*)	-.538(**)	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

To identify the redundant variables the factor analysis is performed and the results are reported in Tables 49.1 to 49.3.

Table 49.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.515
Bartlett's Test of Sphericity	Approx. Chi-Square	143.970
	Df	6
	Sig.	.000

Table 49.2 Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.148	53.701	53.701	2.148	53.701	53.701
2	1.379	34.485	88.185	1.379	34.485	88.185
3	.344	8.603	96.788			
4	.128	3.212	100.000			

*Extraction Method: Principal Component Analysis

Table 49.3 Component Matrix

	Component	
	1	2
FRP(-2)	-.314	.879
INF	.776	.571
MINT	.934	.215
USIR(-2)	-.759	.485

*Extraction Method: Principal Component Analysis
**2 components extracted

Although the value of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is not very high (52%), the Bartlett's test of sphericity, reported in Table 49.1, is at 1% significance level indicating that the factor analysis might be useful. Two components are extracted, which together account for 88% of the variance in the four original variables. These two components are correlated with market integration (MINT) and the second lag of the financial risk premium (FRP(-2)).

Using the results of the factor analysis, Model 1 in Table 50 shows that both FRP(-2) and MINT are statistically significant and explain 12% of the stock market returns in Indonesia. Because the value of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is not very high (52%), we treat the results of the factor analysis with some precaution and test the various combinations of the variables. Interestingly, FRP(-2) stays significant in all models reported in Table 50 and 51 (p.132).

Table 50. Regression results for Indonesia

Model 1		**Model 2**		**Model 3**	
Dependent variable is TR		Dependent variable is TR		Dependent variable is TR	
63 obs from 1988Q2 to 2003Q4		63 obs from 1988Q2 to 2003Q4		63 obs from 1988Q2 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	.44064[.048]	C	.25656[.479]	C	-.043124[.656]
FRP(-2)	1.2441[.068]	FRP(-2)	1.4749[.058]	FRP(-2)	1.7399[.015]
MINT	-3.7106[.009]	INF	-.017203[.522]	INF	-.036829[.011]
		MINT	-2.2681[.392]		
R-Bar-Squared	0.12465	R-Bar-Squared	0.11603	R-Bar-Squared	0.1198
DW-statistic	2.299	DW-statistic	2.2608	DW-statistic	2.1941
Serial Correlation[a]	CHSQ(4)=57.2579[.000]	Serial Correlation[a]	CHSQ(4)= 7.0472[.133]	Serial Correlation[a]	CHSQ(4)= 7.3060[.121]
Heteroscedasticity[b]	CHSQ(1)=.23467[.628]	Heteroscedasticity[b]	CHSQ(1)= .27888[.597]	Heteroscedasticity[b]	CHSQ(1)= .46427[.496]

[a]Lagrange multiplier test of residual serial correlation
[b]Based on the regression of squared residuals on squared fitted values

Table 51. Regression results for Indonesia

Model 4		Model 5		Model 6	
Dependent variable is TR		Dependent variable is TR		Dependent variable is TR	
63 obs from 1988Q2 to 2003Q4		63 obs from 1988Q2 to 2003Q4		63 obs from 1988Q2 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	1.3832[.000]	C	1.1947[.011]	C	.46932[.036]
FRP(-2)	2.6909[.001]	FRP(-2)	2.9317[.001]	FRP(-2)	3.1661[.001]
MINT	-6.1357[.000]	MINT	-4.6503[.077]	INF	-.054236[.001]
USIR(-2)	-11.7605[.003]	INF	-.017763[.480]	USIR(-2)	-9.6839[.012]
		USIR(-2)	-11.7806[.003]		
R-Bar-Squared	0.23204	R-Bar-Squared	0.22554	R-Bar-Squared	0.19606
DW-statistic	2.5413	DW-statistic	2.5051	DW-statistic	2.3166
Serial Correlation[a]	CHSQ(4)= 8.6168[.071]	Serial Correlation[a]	CHSQ(4)= 8.1837[.085]	Serial Correlation[a]	CHSQ(4)= 5.8778[.208]
Heteroscedasticity[b]	CHSQ(1)= 1.4510[.228]	Heteroscedasticity[b]	CHSQ(1)= 1.3776[.241]	Heteroscedasticity[b]	CHSQ(1)= .88191[.348]

[a]Lagrange multiplier test of residual serial correlation
[b]Based on the regression of squared residuals on squared fitted values

In Table 52 the results of the model selection are presented. Both the Akaike Information Criterion and Schwarz Bayesian Criterion show that Model 4 has the best fit, which corresponds with the results of the factor analysis.

Table 52. Model selection for Indonesia

Regressor	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
C	1.1947**	1.3832***	0.46932**	0.25656	0.44064**	-0.043124
FRP(-2)	2.9317***	2.6909***	3.1661***	1.4749*	1.2441*	1.7399**
MINT	(-4.6503)*	(-6.1357)***		-2.2681	(-3.7106)***	
INF	-0.017763		(-0.054236)***	-0.017203		(-0.036829)**
USR(-2)	(-11.7806)***	(-11.7605)***	(-9.6839)**			
R-Bar-Squared	0.22554	0.23204	0.19606	0.11603	0.12465	0.1198
S.E. of Regression	0.31453	0.31321	0.32046	0.33603	33439	0.33531
F-stat.	5.5140[.001]	7.2444[.000]	6.0401[.001]	3.712[.016]	5.4144[.007]	5.2192[.008]
Residual Sum of Squares	5.7378	5.7877	6.0589	6.662	6.7089	6.7461
Equation Log-likelihood	-13.9172	-14.1903	-15.6326	-18.6218	-18.8426	-19.0167
Akaike Info. Criterion	-18.9172	-18.1903	-19.6326	-22.6218	-21.8426	-22.0167
Schwarz Bayesian Criterion	-24.2751	-22.4766	-23.9188	-26.9081	-25.0573	-25.2314

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

6.3.8 Malaysia

Table 53 shows that Institutional Investor's country ratings (II) are found to be statistically significant in explaining the variance in the stock market returns in Malaysia. The coefficient of the Institutional Investor's country ratings has an expected negative sign.

Table 53. Regression results for Malaysia

Regressor	Intercept	T-Ratio[Prob]	Coefficient[1]	T-Ratio[Prob]	R-Bar-Squared	DW statistic[2]	Stationarity of residuals[3]	Heteroscedasticity CHSQ
FRP			0.10581	.041987[.967]				
FRP(-1)			1.1248	.44937[.654]				
FRP(-2)			1.845	.73211[.466]				
FX			-2.28E-02	-.60889[.544]				
FX(-1)			-2.28E-02	-.60217[.549]				
FX(-2)			1.38E-02	.35765[.722]				
INF			-3.54E-02	-.57106[.570]				
INF(-1)			5.37E-02	.87864[.382]				
INF(-2)			2.37E-02	.38082[.704]				
MINT			-6.54E-02	-.29498[.769]				
MINT(-1)			-6.64E-02	-.30374[.762]				
MINT(-2)			-8.00E-02	-.36094[.719]				
II	0.4698	1.8175[.073]	-0.007266	-1.7199[.090]	0.025777	2.2754*	-9.754***	2.5110[.113]
II(-1)			-0.0068597	-1.6283[.108]				
II(-2)			-0.0033318	-.77407[.441]				
USIR			0.36094	.26726[.790]				
USIR(-1)			-0.83429	-.64408[.522]				
USIR(-2)			-1.2274	-.92774[.357]				

[1]***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

[2]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641; for k'=75 d_L=1.598, d_U=1.652

[3]The 99%, 95% and 90% critical values for the ADF unit root test are -3.546, -2.911 and -2.590 respectively. *** indicates 1% significance level and strong evidence against the null hypothesis that the time series has a unit root.

Table 54 (p.134) shows that both Akaike Information Criterion and Schwarz Bayesian criteria choose Model 2 with the Institutional Investor's country risk as the model with the best goodness of fit. The Institutional Investor's country ratings are also statistically significant in Model 1, when all variables are included.

Table 54. Model selection for Malaysia

Regressor	Model 1	Model 2
C	1.5734**	0.48115*
FRP	-2.0498	
FX	-0.18156	
INF	-0.050826	
MINT	0.29376	
II	-0.015178**	-0.0072660*
USIR	-2.3075	
R-Bar-Squared	0.037870	0.026393
S.E. of Regression	0.18333	0.1879
F-stat.	1.4855[.196]	2.9247[.092]
Residual Sum of Squares	2.2856	2.4715
Equation Log-likelihood	24.4876	19.2225
Akaike Info. Criterion	17.4876	17.2225
Schwarz Bayesian Criterion	9.3764	14.9459

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

6.3.9 Thailand

In Thailand only two variables are statistically significant in explaining the behaviour of the stock market returns. They are the second lag of financial risk premium (FRP(-2)) and inflation (INF) (See Table 59).

Table 59. Regression results for Thailand

Regressor	Intercept	T-Ratio[Prob]	Coefficient[1]	T-Ratio[Prob]	R-Bar-Squared	DW statistic[2]	Stationarity of residuals[3]	Heteroscedasticity CHSQ
FRP			0.34948	.52303[.603				
FRP(-1)			0.016888	.02551[.980]				
FRP(-2)	-0.00421	-.1142[.909]	1.5089	2.3376[.022]	0.05762	2.325*	-9.973***	.48886[.484]
FX			-2.11E-03	-.5547[.581]				
FX(-1)			-3.10E-03	-.8123[.419]				
INF	0.14894	2.5817[.012]	-1.04E-01	-1.950[.055]	0.03649	2.4469(-)	-10.672***	1.4913[.222]
INF(-1)			-4.60E-02	-.8448[.401]				
INF(-2)			-6.14E-02	-1.116[.268]				
MINT			-3.95E-01	-.8031[.424]				
MINT(-1)			-3.91E-01	-.7952[.429]				
II			-0.0078817	-1.510[.135]				
II(-1)			-0.0053296	-1.012[.314]				
USIR			0.70635	.39070[.697]				
USIR(-1)			-0.73664	-.4238[.673]				

[1]***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

[2]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641; for k'=75 d_L=1.598, d_U=1.652

[3]The 99%, 95% and 90% critical values for the ADF unit root test are -3.546, –2.911 and -2.590 respectively. *** indicates 1% significance level and strong evidence against the null hypothesis that the time series has a unit root.

The correlation analysis in Table 60 shows that FRP(-2) and INF are not correlated.

Table 60. Correlations matrix

	FRP(-2)	INF
FRP(-2)	1	
INF	.102	1

When FRP(-2) and INF are included together into the regression, they stay statistically significant and explain 11% of the variance in the total returns (See Table 61).

Table 61. Regression analysis results for Thailand

Model 1	
Dependent variable is TR	
74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]
C	.10236[.087]
FRP(-2)	1.6546[.011]
INF	-.11802[.026]
R-Bar-Squared	0.10914
DW-statistic	2.4168
Serial Correlation[a]	CHSQ(4)= 5.8097[.214]
Heteroscedasticity[b]	CHSQ(1)= .046028[.830]

[a]Lagrange multiplier test of residual serial correlation
[b]Based on the regression of squared residuals on squared fitted values

The model selection criteria (i.e. Akaike Information Criterion and Schwarz Bayesian Criterion) shows that the best model among the three models in Table 62 is Model 1 with both the financial risk premium and inflation.

Table 62. Model selection for Thailand

Regressor	Model 1	Model 2	Model 3
C	0.10236*	-0.0042191	0.1496**
FRP(-2)	1.6546**	1.5089**	
INF	(-0.11802)**		(-0.10417)*
R-Bar-Squared	0.10914	0.057629	0.036402
S.E. of Regression	0.23791	0.24469	0.24743
F-stat.	5.4716[.006]	5.4642[.022]	3.7577[.056]
Residual Sum of Squares	4.4078	4.3107	4.0185
Equation Log-likelihood	-0.63631	0.18787	2.7851
Akaike Info. Criterion	-2.6363	-1.8121	-0.21489
Schwarz Bayesian Criterion	-4.9404	-4.1162	-3.671

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

6.3.10 Philippines

In the Philippines the following variables are statistically significant in explaining the variation in the stock market returns: the second lag of financial risk premium (FRP(-2)), foreign exchange rate (FX), the first lag of market integration (MINT), the Institutional Investor's country ratings (II) and the third lag of the U.S. interest rates (USIR) (See Table 55). The coefficients of FRP(-2), FX, MINT(-1) and II have the predicted signs. The coefficient of USIR has a positive sign.

Table 55. Regression results for the Philippines

Regressor	Intercept	T-Ratio[Prob]	Coefficient[1]	T-Ratio[Prob]	R-Bar-Squared	DW statistic[2]	Stationarity of residuals[3]	Heteroscedasticity CHSQ
FRP	-0.098179	-1.6032[.113]	1.3306	2.8488[.006]	0.087724	1.9642*	-8.363***	.71188[.399]
FRP(-1)	-0.11733	-1.9333[.057]	1.4569	3.2222[.002]	0.11253	2.0181*	-8.618***	.42969[.512]
FRP(-2)	-0.15063	-2.4738[.016]	1.7125	3.7989[.000]	0.1554	2.0327*	-8.618***	.57488[.448]
FX	0.2507	3.1375[.002]	-6.05E-03	-2.5573[.013]	0.069649	1.9059*	-8.098***	.31354[.576]
FX(-1)	0.23777	2.9435[.004]	-5.73E-03	-2.3580[.021]	0.058049	1.8592*	-7.909***	.12612[.722]
FX(-2)			-4.21E-03	-1.6385[.106]				
INF			-1.79E-02	-.82794[.410]				
INF(-1)			-1.05E-02	-.50969[.612]				
INF(-2)			9.15E-03	.43704[.663]				
MINT			-1.06E-10	-1.4430[.153]				
MINT(-1)	1.28E-01	2.6957[.009]	-1.36E-10	-1.8029[.076]	0.029512	1.821*	-7.755***	.66306[.415]
MINT(-2)	0.13318	2.7539[.007]	-1.51E-10	-1.9057[.061]	0.034797	1.8461*	-7.800***	.68994[.406]
II	0.36164	3.8400[.000]	-0.009165	-3.3529[.001]	0.12158	1.9999*	-8.500***	.52290[.470]
II(-1)	0.34593	3.6923[.000]	-0.0087704	-3.1988[.002]	0.11092	2.0193*	-8.580***	.75198[.386]
II(-2)	0.35327	3.7425[.000]	-0.0090473	-3.2615[.002]	0.11662	2.0026*	-8.440***	.83606[.361]
USIR			2.4399	1.4020[.165]				
USIR(-1)			1.5463	.91722[.362]				
USIR(-2)			1.9754	1.1475[.255]				

[1]***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

[2]Significance points of Durbin-Watson d statistic at 0.05 level of significance: for k'=70 d_L=1.583, d_U=1.641; for k'=75 d_L=1.598, d_U=1.652

[3]The 99%, 95% and 90% critical values for the ADF unit root test are -3.546, -2.911 and -2.590 respectively. *** indicates 1% significance level and strong evidence against the null hypothesis that the time series has a unit root.

The correlation analysis in Table 56 (p.137) shows that most of the variables under consideration are highly correlated between each other.

Table 56. Correlations matrix

	FRP(-2)	FX	MINT(-1)	II
FRP(-2)	1			
FX	-.802(**)	1		
MINT(-1)	-.768(**)	.947(**)	1	
II	-.944(**)	.853(**)	.786(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

To reduce the number of variables the factor analysis is performed and the results are reported in Tables 57.1 to 57.2 below.

Table 57.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.704
Bartlett's Test of Sphericity	Approx. Chi-Square	412.147
	Df	6
	Sig.	.000

Table 57.2 Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.546	88.642	88.642	3.546	88.642	88.642
2	.351	8.769	97.412			
3	.069	1.720	99.132			
4	.035	.868	100.000			

*Extraction Method: Principal Component Analysis

Table 57.3 Component Matrix

	Component
	1
FRP	-.927
FX	.952
MINT(-1)	.934
II	.948

*Extraction Method: Principal Component Analysis
**1 component extracted

The high value of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (70%) and the Bartlett's test of sphericity at lower than 5% significance level, reported in Table 57.1, indicate that the factor analysis is useful and its results are meaningful with this set of variables. One component is extracted and it accounts for 89% of the variance in all original variables (See Table 57.2). As shown in Table 57.3 this component is highly correlated with the foreign exchange rate, which means that FX (or II) can substitute 4 original variables with only 11% of information loss.

The results of the factor analysis are supported by the model selection results as shown in Table 58. Both Akaike Information criterion and Schwarz Bayesian criterion choose Model 1 with the foreign exchange rate (FX), the second lag of the financial risk premium, country ratings and the first lag of market integration.

Table 58. Model selection for the Philippines

Regressor	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
C	-.39805	(-0.17019)**	-0.53067	-.086374	-.27319	.25352***
FRP(-2)	3.1550**	1.929***	3.0301**	2.1635***	2.0904***	
MINT(-1)	.4997E-9**			0.4499E-9**		
FX	-.014134*			-.010968	.0023932	-.0061129**
II	.0080155		0.006835			
R-Bar-Squared	0.18252	0.16907	0.16423	0.18587	0.14815	0.069820
S.E. of Regression	0.22206	0.22828	0.22894	.22161	.22668	0.23688
F-stat.	5.0746[.001]	15.2431[.000]	7.8776[.001]	6.5555[.001]	7.3481[.001]	6.4794[.013]
Residual Sum of Squares	4.0400	3.5957	3.5642	3.4377	3.6484	3.4026
Equation Log-likelihood	2.5882	5.1502	5.4623	8.5612	6.3607	8.9414
Akaike Info. Criterion	**0.58825**	3.1502	2.4623	4.5612	3.3607	3.9414
Schwarz Bayesian Criterion	-1.8187	0.88751	-0.93176	-0.046907	-0.095408	-1.7158

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

In summary the results show that the Institutional Investor's country ratings and financial risk premiums are the best determinants of the stock market performance in ten Latin American and Asian Pacific countries. Table 63 shows the analysis of the performance of the variables across the countries. The level or the second lag of the financial risk premium is a statistically significant variable in explaining the variance in the stock returns in seven out of ten countries. The closest rival variable, the Institutional Investor's country ratings, explains the fluctuations in the stock markets in three out of ten countries. Inflation is a significant variable in Thailand. The first lag of market integration and foreign exchange rates are also significant together with the financial risk premiums in the Philippines.

Table 63. Summary of the performance of the variables across the countries

Argentina	Brazil	Chile	Colombia	Mexico	Venezuela	Indonesia	Malaysia	Philippines	Thailand
FRP**		FRP***	FRP**	FRP*		FRP(-2)*		FRP(-2)**	FRP(-2)**
	II*				II(-2)**		II*		
								MINT(-1)**	
								FX*	
									INF**

***, **, * indicate significance at 1%, 5% and 10% level respectively. The absence of an asterisk indicates the relevant value is not statistically significant.

6.4 Summary

In conclusion this chapter has relied on the non-stationary time series to analyse the performance of the stock markets. The factor analysis and model selection have been performed to choose the best among the highly correlated set of variables. The results show that the Institutional Investor's country ratings and financial risk premiums are the best determinants of the stock market performance in Latin America and Asia Pacific. Inflation is also a significant variable in Thailand. The more detailed analysis of the role of these variables in explaining the fluctuations of the stock markets and how they substitute the rest of explanatory variables will be discussed in the next chapter.

CHAPTER 7

Financial risk premiums

7.1 Introduction

Chapter 7 discusses the role of financial risk premiums in explaining the fluctuations of the stock returns on emerging equity markets. Section 7.2 analyses the characteristics of the financial risk premiums in the Latin American and Asian Pacific countries. This analysis is continued in Section 7.3 and the relationship between financial risk premiums and other explanatory variables is studied in greater detail. Section 7.4 discusses the role of financial risk premiums as an aggregate risk factor, which can replace five macroeconomic variables. Section 7.5 summarises the chapter.

7.2 Financial risk premiums

The financial risk premium is the one of the important explanatory variables used in this research to explain the behaviour of the stock markets in emerging economies. The level or the second lag of the financial risk premium is a statistically significant variable in explaining the variance of the stock returns in seven out of ten countries (Argentina, Chile, Colombia, Mexico, Indonesia, Thailand and the Phillipines).

The average financial risk premium in the period between 1985 and 2003 is considerably higher in the Latin American countries (0.28%) in comparison to the Asian Pacific countries (0.07%), indicating that the Latin American countries were on average riskier than the Asian Pacific economies (See Table 64, p.141). The maximum financial premium was recorded for Argentina (0.79%), followed by Brazil (0.53%) and Mexico (0.49%). The zero financial risk premiums were recorded for Malaysia and Thailand.

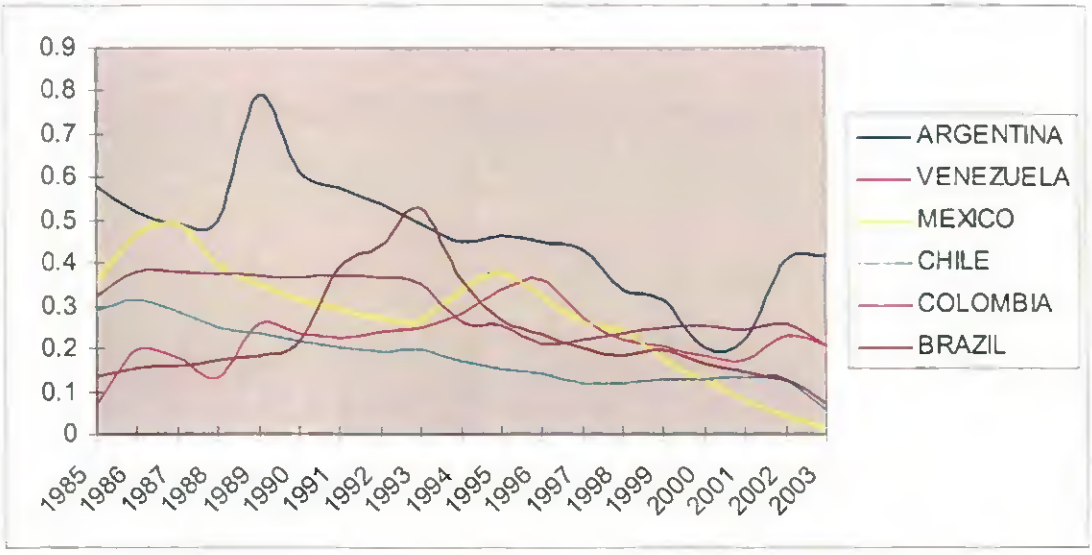
Table 64. Financial risk premiums in the Latin American and Asian Pacific countries

	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
ARGENTINA	0.59	0.20	0.79	0.4608	0.13708	0.019
VENEZUELA	0.29	0.07	0.36	0.2229	0.06633	0.004
MEXICO	0.48	0.02	0.49	0.2728	0.13381	0.018
CHILE	0.26	0.05	0.31	0.1792	0.07088	0.005
COLOMBIA	0.18	0.20	0.38	0.2974	0.06691	0.004
BRAZIL	0.46	0.07	0.53	0.2271	0.11760	0.014
LATIN AMERICA	**0.38**	**0.10**	**0.48**	**0.28**	**0.10**	**0.01**
PHILIPPINES	0.15	0.05	0.20	0.1123	0.04798	0.002
MALAYSIA	0.02	0.00	0.02	0.0021	0.00480	0.000
THAILAND	0.10	0.00	0.10	0.0258	0.02986	0.001
INDONESIA	0.17	0.04	0.21	0.1312	0.05071	0.003
ASIA	**0.11**	**0.02**	**0.13**	**0.07**	**0.03**	**0.002**

Among the Latin American countries the highest average (0.46%) and also the highest maximum financial risk premium (0.79%) is in Argentina while the lowest average premium is in Chile (0.18%). In the Asian Pacific region Indonesia has the highest average financial risk premium of 0.13%, closely followed by the Philippines (0.11%). In Malaysia the average financial risk premium is very low (0.002).

Graphs 6 and 7 (p.142) illustrate the movements of financial risk premiums in Latin America and Asia Pacific. For some countries it is easy to recognise periods of financial turmoil and economic crises. For example, the financial risk premium in Mexico peaked in 1986-1987 when the country was experiencing economic difficulties. First of all, Mexico's economy was hit by the oil price collapse in 1986. During these years Mexican peso devaluated by 45%. In 1987 inflation reached 160% and the Economic Solidarity Pact was enacted to freeze the wages and prices. The second spike in the financial risk premiums coincides with the time of the Tequila crisis in 1994.

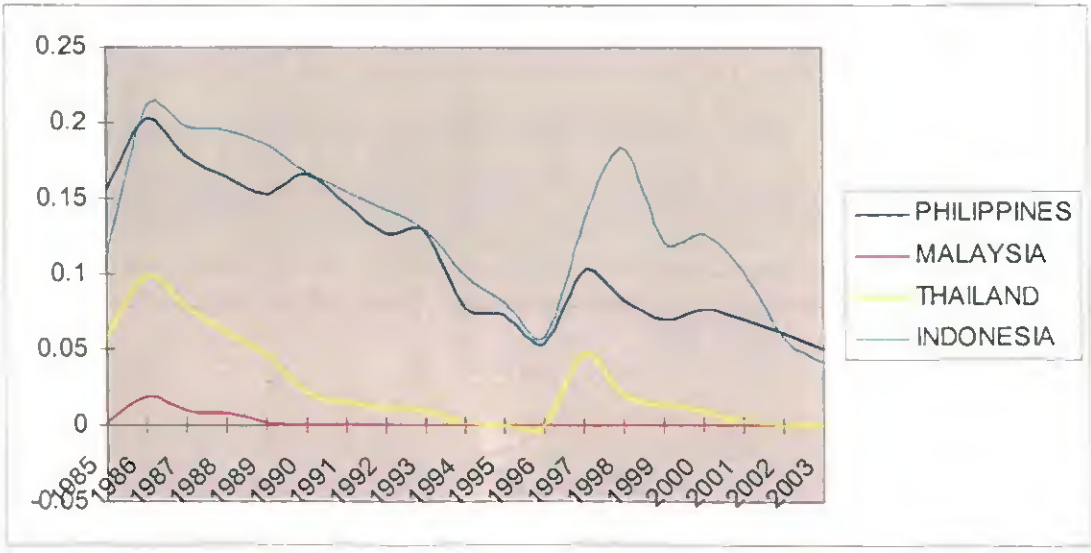
Graph 6. Financial risk premiums in Latin America



In Argentina the first peak coincides with the dramatic devaluation of the Argentinean peso in 1989. The price of dollar rose by 45% and triggered a massive withdrawal of dollar deposits from banks. Also in 1989 World Bank refused to release a significant potion of the credit it had promised. The second spike with a slight delay coincides with the financial crisis in Argentina, when the country defaulted on all its foreign debt.

The financial risk premium movements in four Asian Pacific countries are captured on Graph 7. It is easy to recognise that the financial risk premiums increased significantly around 1997-98 when these countries were hit by the financial crisis in 1997.

Graph 7. Financial risk premiums in Asia



Both in Latin America and Asia Pacific financial risk premiums are highly positively correlated within and between the two regions with few exceptions (See Table 65). While Argentina is correlated with all Latin American countries, it is correlated only with the Philippines in the Asian Pacific region. Brazil and Venezuela are not correlated with any other countries in the Latin America and Asia Pacific with the only exception in the case of Venezuela and the Philippines. The correlation of the financial risk premiums in Venezuela and the Philippines are the only negative correlation in the whole sample. In the Asian Pacific countries the financial risk premiums are highly correlated among all four countries. It can be clearly seen on Graph 7 (p.142).

Table 65. Correlations between financial risk premiums in the Latin American and Asian Pacific countries

	MEX FRP	COL FRP	CHIL FRP	ARG FRP	BR FRP	VEN FBP	IND FRP	PHIL FRP	MAL FRP	THAI FRP
MEXFRP	1	.629**	.815**	.581 **	.215	.042	.635 **	.736 **	.583 **	.676 **
COLFRP	.629**	1	.865**	.677 **	.317	-.332	.732 **	.917 **	.513 *	.592 **
CHILFRP	.815**	.865**	1	.609 **	.098	-.394	.690 **	.922 **	.687 **	.789 **
ARGFRP	.581**	.677**	.609**	1	.229	.083	.364	.650 **	.173	.390
BRFRP	.215	.317	.098	.229	1	.391	.053	.097	-.259	-.305
VENFRP	.042	-.332	-.394	.083	.391	1	-.340	-.413	-.330	-.475 *
INOFRP	.635**	.732**	.690 **	.364	.053	-.340	1	.825 **	.605 **	.744 **
PHILFRP	.736**	.917**	.922 **	.650 **	.097	-.413	.825 **	1	.670 **	.825 **
MALFRP	.583**	.513*	.687 **	.173	-.259	-.330	.605 **	.670 **	1	.844 **
THAIFRP	.676**	.592**	.789 **	.390	-.305	-.475 *	.744 **	.825 **	.844 **	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The different levels of financial risk premiums in the Latin American and Asian Pacific countries support the assumption that these two regions might have different risk profiles. Table 66 (p.144) shows that the means of the financial risk premiums in Latin America and Asia Pacific are statistically different.

Table 66. Comparison of the means of the financial risk premiums in Latin America and Asia

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
LAFP	19	.2766835	.0156421	.0681822	.2438207	.3095462
APFP	19	.0678486	.0070863	.0308884	.0529609	.0827364
Diff	19	.2088348	.0125959	.0549042	.1823719	.2352978
Ho: mean(LAFP - APFP) = mean(diff) = 0						
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0		
t = 16.5796		t = 16.5796		t = 16.5796		
P < t = 1.0000		P > |t| = 0.0000		P > t = 0.0000		

7.3 Financial risk premium as the main determinant of stock market performance

Financial risk premium (FRP) is the variable which proved to perform best across the sample countries to explain the fluctuation in the stock market returns within the period under the consideration. Financial risk premium (FRP) is expected to have a positive sign which means that high financial risk premiums should lead to higher total returns. The regression results in the previous section show that the financial risk premium is statistically significant in explaining the stock market returns in all countries except for Venezuela and Malaysia. The coefficients of the financial risk premiums have a predicted positive sign across all countries in the sample.

It is very important to note that when the regression analysis is repeated with annual data, the similar results are obtained. Financial risk premium is statistically significant in all countries in the sample except for Venezuela and Malaysia (See Appendix II for more details).

In four Latin American countries, namely Argentina, Chile, Colombia and Mexico, the level of the financial risk premium is the best variable in the set of the variables under consideration, which explains between 3% and 7% of the variance in the stock market returns (See Table 67). In Brazil and Venezuela the Institutional Investor's country ratings, the main rival variable of the financial risk premium, explain 2% and 10% of the variance in the stock

market returns respectively (See Table 67). The financial risk premium in Venezuela is not statistically significant.

Table 67. The performance of financial risk premiums in Latin American countries

Regressor	Argentina	Brazil	Chile	Colombia	Mexico	Venezuela
C	(-0.33674)*	0.41285*	-.039498	-.14695	-0.01093	1.3118***
FRP	0.90839**		.66363**	0.66552*	0.33124*	
II		(-0.010353)*				(-0.035622)***
R-Bar-Squared	0.06363	0.024232	.067834	0.030123	0.030117	0.10163
S.E. of Regression	0.42924	0.28441	.15484	0.23039	0.2384	0.26188
F-stat.	6.0286[.016]	2.8377[.096]	6.3850[.014]	3.2672[.075]	3.2979[.073]	9.2586[.003]

In Indonesia the second lag of financial risk premium (FRP(-2)) explains 12% of the variance in the total returns (See Table 68). The financial risk premium is not significant only in Malaysia. The second lag of the financial risk premium (FRP(-2)) together with the first lag of market integration (MINT(-1)) explain 18% of the variance of the stock market returns in the Philippines. In Thailand the second lag of the financial risk premium together with inflation (INF) explain 11% in the fluctuations of the stock market (See Table 68).

Table 68. The performance of financial risk premiums in Asian Pacific countries

Regressor	Indonesia	Malaysia	Philippines	Thailand
C	0.25656	0.48115*	-.39805	0.10236*
FRP(-2)	1.4749*		3.1550**	1.6546**
II		-0.0072660*	0.0080155	
MINT(-1)			0.4997E-9**	
FX			-0.014134*	
INF				(-0.11802)**
R-Bar-Squared	0.11603	0.026393	0.18252	0.10914
S.E. of Regression	0.33603	0.1879	0.22206	0.23791
F-stat.	3.7127[.016]	2.9247[.092]	5.0746[.001]	5.4716[.006]

When annual data is used in the analysis, similar results are obtained. In Argentina the first lag of the financial risk premium is the best variable, which explains 17% of the variance in the stock market returns. The first lag of the financial risk premium alongside GDP are significant explanatory variables accounting for 46% of the variance in the stock market returns in Chile. In Colombia the first lag of financial risk premium explains 40% in the variance in the equity returns. The second lag of financial risk premium in Indonesia explains 25% of the variance in the total returns on the stock market. The first lag of financial risk premium together with GDP explain 72% of the variance in the stock market returns in the Philippines and the second lag of financial risk premium explains 14% of the variance in the stock market returns in Thailand. The financial risk premium is not a significant explanatory variable only in Malaysia and Venezuela.

In summary, the financial risk premiums explain between 3% and 15% of the variance in the quarterly total returns on the stock markets across seven out of ten countries. Moreover, the financial risk premiums can explain between 14% and 50% of the annual fluctuations in the stock markets in eight countries. These results give strong evidence that financial risk premiums are more effective in explaining the behaviour of the stock markets in emerging economies in comparison to other variables considered in this research. It also shows that financial risk premiums can incorporate information contained in other macroeconomic variables like foreign exchange and inflation rates, and they also outperform the Institutional Investor's country ratings, the main rival variable. In the following sections the correlations between financial risk premiums and other variables are analysed.

7.3.1 Financial risk premium and foreign exchange rate

The financial risk premium is found to have a very strong negative correlation with foreign exchange rates in Brazil (-76%)[16], Mexico (-80%), Chile (-88%), the Philippines (-78%), Colombia (-80%), Indonesia (27%*)[17], Malaysia (-41%) and Thailand (-40%) (The correlation matrices can be found in Appendix IV). There is no significant correlation between financial risk premiums and exchange rates only in Argentina and Venezuela. It is striking that foreign exchange rates are found to be significant only in Chile, Mexico and the Philippines, while in these and the other five countries financial risk premiums are more effective in explaining the behaviour of the stock markets in comparison to foreign exchange rates. When the analysis is repeated with annual data a strong negative correlation between financial risk premiums and foreign exchange rates is found in six out of ten countries.

7.3.2 Financial risk premium and inflation

A strong positive correlation is observed between the financial risk premium and inflation rate in the following countries: Argentina (51%), Mexico (69%), Chile (87%), and Colombia (76%) and Venezuela (82%). In Brazil and Malaysia the correlation between financial risk premium and inflation is negative (-81% and -56% respectively). There is significant but very low correlation between financial risk premiums and inflation in Indonesia (32%) and the Philippines (45%), and no correlation in Thailand.

Financial risk premiums are highly positively correlated with inflation in all Latin American countries except for Brazil and have significant but lower correlations in the Asian Pacific countries except for Thailand. Taking into account that the average inflation in the Latin American countries over the sample period was 175% in comparison to a tiny 6% in the Asian Pacific countries, the results in Chapter 6 show that financial risk premiums in Latin

[16] If not stated otherwise, the correlation is significant at the 0.01 level (2-tailed)
[17] * Correlation is significant at the 0.05 level (2-tailed).

America explain the stock market behaviour in countries with the highly inflationary environment and countries with non-existent inflation risk.

7.3.3 Financial risk premium and market integration

The market integration is proxied by the ratio of the trade sector to GDP. There is a considerable difference in the market integration ratios in Latin America and Asia Pacific. The average market integration ratio in the Latin American countries is 0.39, while it is 0.98 in four Asian countries. Despite the regional differences in the levels of market integration, in eight out of ten countries the financial risk premiums have a strong negative correlation with market integration: Brazil (-68%), Colombia (-82%), Mexico (-60%), Argentina (-23%), Chile (32%), Malaysia (-78%), the Philippines (-78%) and Thailand (-72%).

In Venezuela the correlation between the financial risk premium and market integration is positive (65%) and the market integration ratio is the highest in the region (0.50). As an oil-exporting country, Venezuela's economy is highly dependant on oil price fluctuations and a greater openness might result in greater vulnerability to the external shocks and an increase in country default risk. Thus, a positive correlation between market integration and financial risk premiums in Venezuela might be possible. Only in Indonesia there is no relationship between market integration and financial risk premiums and this coincides with the fact that Indonesia has the lowest market integration ratio of 0.55 in comparison to the regional average of 0.98. The relationship between market integration and financial risk premiums will be studied in greater detail in Section 7.1.2.7.

7.3.4 Financial risk premium and Institutional investor's country ratings

There is a significant negative correlation between the financial risk premium and the Institutional Investor's country ratings in six out of ten countries. There is a strong negative correlation in Argentina (-77%), Brazil (-78%), Chile (-95%), Colombia (-64%), Mexico (-89%), Venezuela (-39%) and the Philippines (-93%). In Indonesia the correlation is positive

(42%), and there is no statistically significant correlation between the financial risk premium and the Institutional Investor's country ratings in Malaysia and Thailand.

In the Asian Pacific countries where the Institutional Investor's country rating failed to anticipate the crisis of 1997, there is no statistically significant correlation between the financial risk premiums and country ratings (e.g. Malaysia and Thailand). The positive correlation in Indonesia might mean that the Institutional Investor's country ratings were neglecting the increasing country default risk.

When annual data is used, similar results are obtained. There is a strong negative correlation between financial risk premiums and the Institutional Investor's country ratings in all Latin American countries except for Venezuela. There is no significant correlation in Malaysia, Thailand and Indonesia.

7.3.5 Financial risk premium and the U.S. interest rates

There is a very strong positive correlation between financial risk premiums and the U.S. interest rates in all countries except for Venezuela, where the correlation between the financial risk premium and the U.S. interest rates is negative (-26%). The positive correlation is present in Argentina (61%), Brazil (49%), Mexico (77%), Chile (83%), Colombia (73%), the Philippines (80%), Indonesia (54%), Malaysia (55%), the Philippines (82%) and Thailand (66%). There are positive correlations between financial risk premiums and the U.S. interest rates in seven out of ten countries when annual data is used.

Theoretically the relation between the financial risk premium and the U.S. interest rates should be positive. This means that lower U.S. interest rates should lead to lower financial risk premiums. Taking into account that the U.S. interest rates were falling during the period under consideration, a negative relationship means that the falling U.S. intrest rates coincided with higher country default risk. This means that the falling U.S. interest rates did not

necessarily lead to lower country default risk by making borrowing less expensive. The relationship between financial risk premiums and the U.S. interest rates will be studied in graiter detail in the section below.

7.4 Financial risk premium as an aggregate risk factor

The previous results show that financial risk premiums explain the fluctuations in the total returns on the stock markets in seven countries in the sample. The correlation analysis in this chapter also shows that financial risk premiums are highly correlated with most of the other macroeconomic variables under consideration. In order to find more evidence that financial risk premiums can be used as an aggregate risk factor substituting other macroeconomic variables, financial risk premiums are regressed on five macroeconomic variables used in this research. Below a country-by-country analysis is presented.

In Argentina all five variables, including foreign exchange rates, inflation, market integration, the Institutional Investor's country ratings and the U.S. interest rates, are statistically significant in explaining the variations in financial risk premiums as shown in Table 69. Together these five variables explain 73% of variation in the financial risk premiums in Argentina.

Table 69. Financial risk premium in Argentina

Argentina						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	C	FX	INF	MINT	II	USIR
Coefficient	0.41394***	0.067876**	1.03E-04**	-1.7177*	-0.007154***	4.2433***
T-Ratio[Prob]	3.9285[.000]	2.6652[.010]	2.0883[.040]	-1.739[.086]	-6.1892[.000]	4.506[.000]
R-Bar-Squared	0.73013		Serial Correlation		CHSQ(4)=27.9910[.000]	
F-stat.	41.5819[.000]		Heteroscedasticity		CHSQ(1)=3.7019[.054]	
DW-statistic	0.89434					

It is also important to note that all the coefficients of the independent variables have expected signs. Depreciation (appreciation) of the local currency, rising (falling) inflation and rising (falling) U.S. interest rates will result in an increase (decrease) in financial risk premiums. On the other hand, with higher (lower) market integration and lower (higher) country risk as reflected in the Institutional Investor's country ratings, the financial risk premiums decrease (increase).

In Brazil the same five variables are found to be statistically significant in explaining the variance in the financial risk premiums as shown in Table 70. Together they predict 71% of the variance in FRP. In Brazil the relationship between financial risk premiums and inflation, market integration and country ratings are as expected. Only foreign exchange rates and the U.S. interest rates have negative sign in contrast to the expected positive relationship.

Table 70. Financial risk premium in Brazil

Brazil						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	C	FX	INF	MINT	II	USIR
Coefficient	**0.95841*** **	**-0.050274***	**2.68E-05***	**-3.1839***	**-0.011497*** **	**-2.3728** **
T-Ratio[Prob]	5.7928[.000]	-1.8697[.066]	1.7457[.085]	-1.8542[.068]	-3.2438[.002]	-2.6026[.011]
R-Bar-Squared	**0.70509**		Serial Correlation		CHSQ(4)=	40.8753[.000]
F-stat.	36.8626[.000]		Heteroscedasticity		CHSQ(1)=	.29918[.584]
DW-statistic	0.57416					

In Chile four out of five explanatory variables are statistically significant and together explain 94% of the variation in financial risk premiums as shown in Table 71 (p.152). These variables are foreign exchange rates, inflation, market integration and the Institutional Investor's country ratings. Their coefficients have expected signs. Deprecation (appreciation) of the local currency and rising (falling) inflation will drive financial risk premiums up (down). Higher (lower) market integration and lower (higher) country risk, on the contrary,

will reduce (increase) financial risk premiums. The only explanatory variable, which is not statistically significant, is the U.S. interest rates.

Table 71. Financial risk premium in Chile

Chile						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	**C**	**FX**	**INF**	**MINT**	**II**	**USIR**
Coefficient	**0.55845*** **	**0.000059*** **	**0.00413***	**-1.3411*** **	**-0.00437*** **	**-0.21846**
T-Ratio[Prob]	13.5917[.000]	13.5917[.000]	1.7337[.087]	-6.4558[.000]	-11.6551[.000]	-.77717[.440]
R-Bar-Squared	**0.94239**		Serial Correlation		CHSQ(4)=50.6643[.000]	
F-stat.	246.3637[.000]		Heteroscedasticity		CHSQ(1)=3.9609[.047]	
DW-statistic	0.38752					

In Colombia, as shown in Table 72, foreign exchange rates, inflation, market integration and the Institutional Investors' country ratings can explain 90% of the variance in financial risk premiums. The coefficients of these explanatory variables have expected signs. Deprecation (appreciation) of the local currency and rising (falling) inflation will drive financial risk premiums up (down). Higher (lower) market integration and lower (higher) country risk, on the contrary, will reduce (increase) financial risk premiums. The U.S. interest rates is the only explanatory variable, which is not statistically significant to explain FRP.

Table 72. Financial risk premium in Colombia

Colombia						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	**C**	**FX**	**INF**	**MINT**	**II**	**USIR**
Coefficient	**0.91337*** **	**-7.48E-06**	**-0.0136*** **	**-0.00000*** **	**-0.00972*** **	**-0.12862**
T-Ratio[Prob]	15.498[.000]	-.52414[.602]	-3.9492[.000]	-6.3126[.000]	-13.276[.000]	-.41245[.681]
R-Bar-Squared	**0.9044**		Serial Correlation		CHSQ(4)= 26.7328[.000]	
F-stat.	142.9105[.000]		Heteroscedasticity		CHSQ(1)= 4.2853[.038]	
DW-statistic	0.90737					

It is also important to note that all the coefficients of the independent variables have expected signs. Depreciation (appreciation) of the local currency, rising (falling) inflation and rising (falling) U.S. interest rates will result in an increase (decrease) in financial risk premiums. On the other hand, with higher (lower) market integration and lower (higher) country risk as reflected in the Institutional Investor's country ratings, the financial risk premiums decrease (increase).

In Brazil the same five variables are found to be statistically significant in explaining the variance in the financial risk premiums as shown in Table 70. Together they predict 71% of the variance in FRP. In Brazil the relationship between financial risk premiums and inflation, market integration and country ratings are as expected. Only foreign exchange rates and the U.S. interest rates have negative sign in contrast to the expected positive relationship.

Table 70. Financial risk premium in Brazil

Brazil						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	**C**	**FX**	**INF**	**MINT**	**It**	**USIR**
Coefficient	**0.95841*** **	**-0.050274***	**2.68E-05***	**-3.1839***	**-0.011497*** **	**-2.3728** **
T-Ratio[Prob]	5.7928[.000]	-1.8697[.066]	1.7457[.085]	-1.8542[.068]	-3.2438[.002]	-2.6026[.011]
R-Bar-Squared	**0.70509**		Serial Correlation		CHSQ(4)=	40.8753[.000]
F-stat.	36.8626[.000]		Heteroscedasticity		CHSQ(1)=	.29918[.584]
DW-statistic	0.57416					

In Chile four out of five explanatory variables are statistically significant and together explain 94% of the variation in financial risk premiums as shown in Table 71 (p.152). These variables are foreign exchange rates, inflation, market integration and the Institutional Investor's country ratings. Their coefficients have expected signs. Deprecation (appreciation) of the local currency and rising (falling) inflation will drive financial risk premiums up (down). Higher (lower) market integration and lower (higher) country risk, on the contrary,

necessarily lead to lower country default risk by making borrowing less expensive. The relationship between financial risk premiums and the U.S. interest rates will be studied in graiter detail in the section below.

7.4 Financial risk premium as an aggregate risk factor

The previous results show that financial risk premiums explain the fluctuations in the total returns on the stock markets in seven countries in the sample. The correlation analysis in this chapter also shows that financial risk premiums are highly correlated with most of the other macroeconomic variables under consideration. In order to find more evidence that financial risk premiums can be used as an aggregate risk factor substituting other macroeconomic variables, financial risk premiums are regressed on five macroeconomic variables used in this research. Below a country-by-country analysis is presented.

In Argentina all five variables, including foreign exchange rates, inflation, market integration, the Institutional Investor's country ratings and the U.S. interest rates, are statistically significant in explaining the variations in financial risk premiums as shown in Table 69. Together these five variables explain 73% of variation in the financial risk premiums in Argentina.

Table 69. Financial risk premium in Argentina

Argentina						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	**C**	**FX**	**INF**	**MINT**	**II**	**USIR**
Coefficient	**0.41394*** **	**0.067876** **	**1.03E-04** **	**-1.7177***	**-0.007154*** **	**4.2433*** **
T-Ratio[Prob]	3.9285[.000]	2.6652[.010]	2.0883[.040]	-1.739[.086]	-6.1892[.000]	4.506[.000]
R-Bar-Squared	**0.73013**		Serial Correlation		CHSQ(4)=27.9910[.000]	
F-stat.	41.5819[.000]		Heteroscedasticity		CHSQ(1)=3.7019[.054]	
DW-statistic	0.89434					

(42%), and there is no statistically significant correlation between the financial risk premium and the Institutional Investor's country ratings in Malaysia and Thailand.

In the Asian Pacific countries where the Institutional Investor's country rating failed to anticipate the crisis of 1997, there is no statistically significant correlation between the financial risk premiums and country ratings (e.g. Malaysia and Thailand). The positive correlation in Indonesia might mean that the Institutional Investor's country ratings were neglecting the increasing country default risk.

When annual data is used, similar results are obtained. There is a strong negative correlation between financial risk premiums and the Institutional Investor's country ratings in all Latin American countries except for Venezuela. There is no significant correlation in Malaysia, Thailand and Indonesia.

7.3.5 Financial risk premium and the U.S. interest rates

There is a very strong positive correlation between financial risk premiums and the U.S. interest rates in all countries except for Venezuela, where the correlation between the financial risk premium and the U.S. interest rates is negative (-26%). The positive correlation is present in Argentina (61%), Brazil (49%), Mexico (77%), Chile (83%), Colombia (73%), the Philippines (80%), Indonesia (54%), Malaysia (55%), the Philippines (82%) and Thailand (66%). There are positive correlations between financial risk premiums and the U.S. interest rates in seven out of ten countries when annual data is used.

Theoretically the relation between the financial risk premium and the U.S. interest rates should be positive. This means that lower U.S. interest rates should lead to lower financial risk premiums. Taking into account that the U.S. interest rates were falling during the period under consideration, a negative relationship means that the falling U.S. intrest rates coincided with higher country default risk. This means that the falling U.S. interest rates did not

America explain the stock market behaviour in countries with the highly inflationary environment and countries with non-existent inflation risk.

7.3.3 Financial risk premium and market integration

The market integration is proxied by the ratio of the trade sector to GDP. There is a considerable difference in the market integration ratios in Latin America and Asia Pacific. The average market integration ratio in the Latin American countries is 0.39, while it is 0.98 in four Asian countries. Despite the regional differences in the levels of market integration, in eight out of ten countries the financial risk premiums have a strong negative correlation with market integration: Brazil (-68%), Colombia (-82%), Mexico (-60%), Argentina (-23%), Chile (32%), Malaysia (-78%), the Philippines (-78%) and Thailand (-72%).

In Venezuela the correlation between the financial risk premium and market integration is positive (65%) and the market integration ratio is the highest in the region (0.50). As an oil-exporting country, Venezuela's economy is highly dependant on oil price fluctuations and a greater openness might result in greater vulnerability to the external shocks and an increase in country default risk. Thus, a positive correlation between market integration and financial risk premiums in Venezuela might be possible. Only in Indonesia there is no relationship between market integration and financial risk premiums and this coincides with the fact that Indonesia has the lowest market integration ratio of 0.55 in comparison to the regional average of 0.98. The relationship between market integration and financial risk premiums will be studied in greater detail in Section 7.1.2.7.

7.3.4 Financial risk premium and Institutional investor's country ratings

There is a significant negative correlation between the financial risk premium and the Institutional Investor's country ratings in six out of ten countries. There is a strong negative correlation in Argentina (-77%), Brazil (-78%), Chile (-95%), Colombia (-64%), Mexico (-89%), Venezuela (-39%) and the Philippines (-93%). In Indonesia the correlation is positive

7.3.1 Financial risk premium and foreign exchange rate

The financial risk premium is found to have a very strong negative correlation with foreign exchange rates in Brazil (-76%)[16], Mexico (-80%), Chile (-88%), the Philippines (-78%), Colombia (-80%), Indonesia (27%*)[17], Malaysia (-41%) and Thailand (-40%) (The correlation matrices can be found in Appendix IV). There is no significant correlation between financial risk premiums and exchange rates only in Argentina and Venezuela. It is striking that forcign exchange rates are found to be significant only in Chile, Mexico and the Philippines, while in these and the other five countries financial risk premiums are more effective in explaining the behaviour of the stock markets in comparison to foreign exchange rates. When the analysis is repeated with annual data a strong negative correlation between financial risk premiums and foreign exchange rates is found in six out of ten countries.

7.3.2 Financial risk premium and inflation

A strong positive correlation is observed between the financial risk premium and inflation rate in the following countries: Argentina (51%), Mexico (69%), Chile (87%), and Colombia (76%) and Venezuela (82%). In Brazil and Malaysia the correlation between financial risk premium and inflation is negative (-81% and -56% respectively). There is significant but very low correlation between financial risk premiums and inflation in Indonesia (32%) and the Philippines (45%), and no correlation in Thailand.

Financial risk premiums are highly positively correlated with inflation in all Latin American countries except for Brazil and have significant but lower correlations in the Asian Pacific countries except for Thailand. Taking into account that the average inflation in the Latin American countries over the sample period was 175% in comparison to a tiny 6% in the Asian Pacific countries, the results in Chapter 6 show that financial risk premiums in Latin

[16] If not stated otherwise, the correlation is significant at the 0.01 level (2-tailed)
[17] * Correlation is significant at the 0.05 level (2-tailed).

When annual data is used in the analysis, similar results are obtained. In Argentina the first lag of the financial risk premium is the best variable, which explains 17% of the variance in the stock market returns. The first lag of the financial risk premium alongside GDP are significant explanatory variables accounting for 46% of the variance in the stock market returns in Chile. In Colombia the first lag of financial risk premium explains 40% in the variance in the equity returns. The second lag of financial risk premium in Indonesia explains 25% of the variance in the total returns on the stock market. The first lag of financial risk premium together with GDP explain 72% of the variance in the stock market returns in the Philippines and the second lag of financial risk premium explains 14% of the variance in the stock market returns in Thailand. The financial risk premium is not a significant explanatory variable only in Malaysia and Venezuela.

In summary, the financial risk premiums explain between 3% and 15% of the variance in the quarterly total returns on the stock markets across seven out of ten countries. Moreover, the financial risk premiums can explain between 14% and 50% of the annual fluctuations in the stock markets in eight countries. These results give strong evidence that financial risk premiums are more effective in explaining the behaviour of the stock markets in emerging economies in comparison to other variables considered in this research. It also shows that financial risk premiums can incorporate information contained in other macroeconomic variables like foreign exchange and inflation rates, and they also outperform the Institutional Investor's country ratings, the main rival variable. In the following sections the correlations between financial risk premiums and other variables are analysed.

market returns respectively (See Table 67). The financial risk premium in Venezuela is not statistically significant.

Table 67. The performance of financial risk premiums in Latin American countries

Regressor	Argentina	Brazil	Chile	Colombia	Mexico	Venezuela
C	(-0.33674)*	0.41285*	-.039498	-.14695	-0.01093	1.3118***
FRP	0.90839**		.66363**	0.66552*	0.33124*	
II		(-0.010353)*				(-0.035622)***
R-Bar-Squared	0.06363	0.024232	.067834	0.030123	0.030117	0.10163
S.E. of Regression	0.42924	0.28441	.15484	0.23039	0.2384	0.26188
F-stat.	6.0286[.016]	2.8377[.096]	6.3850[.014]	3.2672[.075]	3.2979[.073]	9.2586[.003]

In Indonesia the second lag of financial risk premium (FRP(-2)) explains 12% of the variance in the total returns (See Table 68). The financial risk premium is not significant only in Malaysia. The second lag of the financial risk premium (FRP(-2)) together with the first lag of market integration (MINT(-1)) explain 18% of the variance of the stock market returns in the Philippines. In Thailand the second lag of the financial risk premium together with inflation (INF) explain 11% in the fluctuations of the stock market (See Table 68).

Table 68. The performance of financial risk premiums in Asian Pacific countries

Regressor	Indonesia	Malaysia	Philippines	Thailand
C	0.25656	0.48115*	-.39805	0.10236*
FRP(-2)	1.4749*		3.1550**	1.6546**
II		-0.0072660*	0.0080155	
MINT(-1)			0.4997E-9**	
FX			-0.014134*	
INF				(-0.11802)**
R-Bar-Squared	0.11603	0.026393	0.18252	0.10914
S.E. of Regression	0.33603	0.1879	0.22206	0.23791
F-stat.	3.7127[.016]	2.9247[.092]	5.0746[.001]	5.4716[.006]

Table 66. Comparison of the means of the financial risk premiums in Latin America and Asia

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
LAFP	19	.2766835	.0156421	.0681822	.2438207	.3095462
APFP	19	.0678486	.0070863	.0308884	.0529609	.0827364
Diff	19	.2088348	.0125959	.0549042	.1823719	.2352978
Ho: mean(LAFP - APFP) = mean(diff) = 0						
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0		
t = 16.5796		t = 16.5796		t = 16.5796		
P < t = 1.0000		P > |t| = 0.0000		P > t = 0.0000		

7.3 Financial risk premium as the main determinant of stock market performance

Financial risk premium (FRP) is the variable which proved to perform best across the sample countries to explain the fluctuation in the stock market returns within the period under the consideration. Financial risk premium (FRP) is expected to have a positive sign which means that high financial risk premiums should lead to higher total returns. The regression results in the previous section show that the financial risk premium is statistically significant in explaining the stock market returns in all countries except for Venezuela and Malaysia. The coefficients of the financial risk premiums have a predicted positive sign across all countries in the sample.

It is very important to note that when the regression analysis is repeated with annual data, the similar results are obtained. Financial risk premium is statistically significant in all countries in the sample except for Venezuela and Malaysia (See Appendix II for more details).

In four Latin American countries, namely Argentina, Chile, Colombia and Mexico, the level of the financial risk premium is the best variable in the set of the variables under consideration, which explains between 3% and 7% of the variance in the stock market returns (See Table 67). In Brazil and Venezuela the Institutional Investor's country ratings, the main rival variable of the financial risk premium, explain 2% and 10% of the variance in the stock

Both in Latin America and Asia Pacific financial risk premiums are highly positively correlated within and between the two regions with few exceptions (See Table 65). While Argentina is correlated with all Latin American countries, it is correlated only with the Philippines in the Asian Pacific region. Brazil and Venezuela are not correlated with any other countries in the Latin America and Asia Pacific with the only exception in the case of Venezuela and the Philippines. The correlation of the financial risk premiums in Venezuela and the Philippines are the only negative correlation in the whole sample. In the Asian Pacific countries the financial risk premiums are highly correlated among all four countries. It can be clearly seen on Graph 7 (p.142).

Table 65. Correlations between financial risk premiums in the Latin American and Asian Pacific countries

	MEX FRP	COL FRP	CHIL FRP	ARG FRP	BR FRP	VEN FRP	IND FRP	PHIL FRP	MAL FRP	THAI FRP
MEXFRP	1	.629**	.815**	.581**	.215	.042	.635**	.736**	.583**	.676**
COLFRP	.629**	1	.865**	.677**	.317	-.332	.732**	.917**	.513*	.592**
CHILFRP	.815**	.865**	1	.609**	.098	-.394	.690**	.922**	.687**	.789**
ARGFRP	.581**	.677**	.609**	1	.229	.083	.364	.650**	.173	.390
BRFRP	.215	.317	.098	.229	1	.391	.053	.097	-.259	-.305
VENFRP	.042	-.332	-.394	.083	.391	1	-.340	-.413	-.330	-.475*
INDFRP	.635**	.732**	.690**	.364	.053	-.340	1	.825**	.605**	.744**
PHILFRP	.736**	.917**	.922**	.650**	.097	-.413	.825**	1	.670**	.825**
MALFRP	.583**	.513*	.687**	.173	-.259	-.330	.605**	.670**	1	.844**
THAIFRP	.676**	.592**	.789**	.390	-.305	-.475*	.744**	.825**	.844**	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The different levels of financial risk premiums in the Latin American and Asian Pacific countries support the assumption that these two regions might have different risk profiles. Table 66 (p.144) shows that the means of the financial risk premiums in Latin America and Asia Pacific are statistically different.

Table 66. Comparison of the means of the financial risk premiums in Latin America and Asia

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
LAFP	19	.2766835	.0156421	.0681822	.2438207	.3095462
APFP	19	.0678486	.0070863	.0308884	.0529609	.0827364
Diff	19	.2088348	.0125959	.0549042	.1823719	.2352978
Ho: mean(LAFP - APFP) = mean(diff) = 0						
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0		
t = 16.5796		t = 16.5796		t = 16.5796		
P < t = 1.0000		P > |t| = 0.0000		P > t = 0.0000		

7.3 Financial risk premium as the main determinant of stock market performance

Financial risk premium (FRP) is the variable which proved to perform best across the sample countries to explain the fluctuation in the stock market returns within the period under the consideration. Financial risk premium (FRP) is expected to have a positive sign which means that high financial risk premiums should lead to higher total returns. The regression results in the previous section show that the financial risk premium is statistically significant in explaining the stock market returns in all countries except for Venezuela and Malaysia. The coefficients of the financial risk premiums have a predicted positive sign across all countries in the sample.

It is very important to note that when the regression analysis is repeated with annual data, the similar results are obtained. Financial risk premium is statistically significant in all countries in the sample except for Venezuela and Malaysia (See Appendix II for more details).

In four Latin American countries, namely Argentina, Chile, Colombia and Mexico, the level of the financial risk premium is the best variable in the set of the variables under consideration, which explains between 3% and 7% of the variance in the stock market returns (See Table 67). In Brazil and Venezuela the Institutional Investor's country ratings, the main rival variable of the financial risk premium, explain 2% and 10% of the variance in the stock

market returns respectively (See Table 67). The financial risk premium in Venezuela is not statistically significant.

Table 67. The performance of financial risk premiums in Latin American countries

Regressor	Argentina	Brazil	Chile	Colombia	Mexico	Venezuela
C	(-0.33674)*	0.41285*	-.039498	-.14695	-0.01093	1.3118***
FRP	0.90839**		.66363**	0.66552*	0.33124*	
II		(-0.010353)*				(-0.035622)***
R-Bar-Squared	0.06363	0.024232	.067834	0.030123	0.030117	0.10163
S.E. of Regression	0.42924	0.28441	.15484	0.23039	0.2384	0.26188
F-stat.	6.0286[.016]	2.8377[.096]	6.3850[.014]	3.2672[.075]	3.2979[.073]	9.2586[.003]

In Indonesia the second lag of financial risk premium (FRP(-2)) explains 12% of the variance in the total returns (See Table 68). The financial risk premium is not significant only in Malaysia. The second lag of the financial risk premium (FRP(-2)) together with the first lag of market integration (MINT(-1)) explain 18% of the variance of the stock market returns in the Philippines. In Thailand the second lag of the financial risk premium together with inflation (INF) explain 11% in the fluctuations of the stock market (See Table 68).

Table 68. The performance of financial risk premiums in Asian Pacific countries

Regressor	Indonesia	Malaysia	Philippines	Thailand
C	0.25656	0.48115*	-.39805	0.10236*
FRP(-2)	1.4749*		3.1550**	1.6546**
II		-0.0072660*	0.0080155	
MINT(-1)			0.4997E-9**	
FX			-0.014134*	
INF				(-0.11802)**
R-Bar-Squared	0.11603	0.026393	0.18252	0.10914
S.E. of Regression	0.33603	0.1879	0.22206	0.23791
F-stat.	3.7127[.016]	2.9247[.092]	5.0746[.001]	5.4716[.006]

When annual data is used in the analysis, similar results are obtained. In Argentina the first lag of the financial risk premium is the best variable, which explains 17% of the variance in the stock market returns. The first lag of the financial risk premium alongside GDP are significant explanatory variables accounting for 46% of the variance in the stock market returns in Chile. In Colombia the first lag of financial risk premium explains 40% in the variance in the equity returns. The second lag of financial risk premium in Indonesia explains 25% of the variance in the total returns on the stock market. The first lag of financial risk premium together with GDP explain 72% of the variance in the stock market returns in the Philippines and the second lag of financial risk premium explains 14% of the variance in the stock market returns in Thailand. The financial risk premium is not a significant explanatory variable only in Malaysia and Venezuela.

In summary, the financial risk premiums explain between 3% and 15% of the variance in the quarterly total returns on the stock markets across seven out of ten countries. Moreover, the financial risk premiums can explain between 14% and 50% of the annual fluctuations in the stock markets in eight countries. These results give strong evidence that financial risk premiums are more effective in explaining the behaviour of the stock markets in emerging economies in comparison to other variables considered in this research. It also shows that financial risk premiums can incorporate information contained in other macroeconomic variables like foreign exchange and inflation rates, and they also outperform the Institutional Investor's country ratings, the main rival variable. In the following sections the correlations between financial risk premiums and other variables are analysed.

7.3.1 Financial risk premium and foreign exchange rate

The financial risk premium is found to have a very strong negative correlation with foreign exchange rates in Brazil (-76%)[16], Mexico (-80%), Chile (-88%), the Philippines (-78%), Colombia (-80%), Indonesia (27%*)[17], Malaysia (-41%) and Thailand (-40%) (The correlation matrices can be found in Appendix IV). There is no significant correlation between financial risk premiums and exchange rates only in Argentina and Venezuela. It is striking that foreign exchange rates are found to be significant only in Chile, Mexico and the Philippines, while in these and the other five countries financial risk premiums are more effective in explaining the behaviour of the stock markets in comparison to foreign exchange rates. When the analysis is repeated with annual data a strong negative correlation between financial risk premiums and foreign exchange rates is found in six out of ten countries.

7.3.2 Financial risk premium and inflation

A strong positive correlation is observed between the financial risk premium and inflation rate in the following countries: Argentina (51%), Mexico (69%), Chile (87%), and Colombia (76%) and Venezuela (82%). In Brazil and Malaysia the correlation between financial risk premium and inflation is negative (-81% and -56% respectively). There is significant but very low correlation between financial risk premiums and inflation in Indonesia (32%) and the Philippines (45%), and no correlation in Thailand.

Financial risk premiums are highly positively correlated with inflation in all Latin American countries except for Brazil and have significant but lower correlations in the Asian Pacific countries except for Thailand. Taking into account that the average inflation in the Latin American countries over the sample period was 175% in comparison to a tiny 6% in the Asian Pacific countries, the results in Chapter 6 show that financial risk premiums in Latin

[16] If not stated otherwise, the correlation is significant at the 0.01 level (2-tailed)

[17] * Correlation is significant at the 0.05 level (2-tailed).

America explain the stock market behaviour in countries with the highly inflationary environment and countries with non-existent inflation risk.

7.3.3 Financial risk premium and market integration

The market integration is proxied by the ratio of the trade sector to GDP. There is a considerable difference in the market integration ratios in Latin America and Asia Pacific. The average market integration ratio in the Latin American countries is 0.39, while it is 0.98 in four Asian countries. Despite the regional differences in the levels of market integration, in eight out of ten countries the financial risk premiums have a strong negative correlation with market integration: Brazil (-68%), Colombia (-82%), Mexico (-60%), Argentina (-23%), Chile (32%), Malaysia (-78%), the Philippines (-78%) and Thailand (-72%).

In Venezuela the correlation between the financial risk premium and market integration is positive (65%) and the market integration ratio is the highest in the region (0.50). As an oil-exporting country, Venezuela's economy is highly dependant on oil price fluctuations and a greater openness might result in greater vulnerability to the external shocks and an increase in country default risk. Thus, a positive correlation between market integration and financial risk premiums in Venezuela might be possible. Only in Indonesia there is no relationship between market integration and financial risk premiums and this coincides with the fact that Indonesia has the lowest market integration ratio of 0.55 in comparison to the regional average of 0.98. The relationship between market integration and financial risk premiums will be studied in greater detail in Section 7.1.2.7.

7.3.4 Financial risk premium and Institutional investor's country ratings

There is a significant negative correlation between the financial risk premium and the Institutional Investor's country ratings in six out of ten countries. There is a strong negative correlation in Argentina (-77%), Brazil (-78%), Chile (-95%), Colombia (-64%), Mexico (-89%), Venezuela (-39%) and the Philippines (-93%). In Indonesia the correlation is positive

(42%), and there is no statistically significant correlation between the financial risk premium and the Institutional Investor's country ratings in Malaysia and Thailand.

In the Asian Pacific countries where the Institutional Investor's country rating failed to anticipate the crisis of 1997, there is no statistically significant correlation between the financial risk premiums and country ratings (e.g. Malaysia and Thailand). The positive correlation in Indonesia might mean that the Institutional Investor's country ratings were neglecting the increasing country default risk.

When annual data is used, similar results are obtained. There is a strong negative correlation between financial risk premiums and the Institutional Investor's country ratings in all Latin American countries except for Venezuela. There is no significant correlation in Malaysia, Thailand and Indonesia.

7.3.5 Financial risk premium and the U.S. interest rates

There is a very strong positive correlation between financial risk premiums and the U.S. interest rates in all countries except for Venezuela, where the correlation between the financial risk premium and the U.S. interest rates is negative (-26%). The positive correlation is present in Argentina (61%), Brazil (49%), Mexico (77%), Chile (83%), Colombia (73%), the Philippines (80%), Indonesia (54%), Malaysia (55%), the Philippines (82%) and Thailand (66%). There are positive correlations between financial risk premiums and the U.S. interest rates in seven out of ten countries when annual data is used.

Theoretically the relation between the financial risk premium and the U.S. interest rates should be positive. This means that lower U.S. interest rates should lead to lower financial risk premiums. Taking into account that the U.S. interest rates were falling during the period under consideration, a negative relationship means that the falling U.S. intrest rates coincided with higher country default risk. This means that the falling U.S. interest rates did not

necessarily lead to lower country default risk by making borrowing less expensive. The relationship between financial risk premiums and the U.S. interest rates will be studied in graiter detail in the section below.

7.4 Financial risk premium as an aggregate risk factor

The previous results show that financial risk premiums explain the fluctuations in the total returns on the stock markets in seven countries in the sample. The correlation analysis in this chapter also shows that financial risk premiums are highly correlated with most of the other macroeconomic variables under consideration. In order to find more evidence that financial risk premiums can be used as an aggregate risk factor substituting other macroeconomic variables, financial risk premiums are regressed on five macroeconomic variables used in this research. Below a country-by-country analysis is presented.

In Argentina all five variables, including foreign exchange rates, inflation, market integration, the Institutional Investor's country ratings and the U.S. interest rates, are statistically significant in explaining the variations in financial risk premiums as shown in Table 69. Together these five variables explain 73% of variation in the financial risk premiums in Argentina.

Table 69. Financial risk premium in Argentina

Argentina						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	C	FX	INF	MINT	II	USIR
Coefficient	**0.41394*** **	**0.067876** **	**1.03E-04** **	**-1.7177***	**-0.007154*** **	**4.2433*** **
T-Ratio[Prob]	3.9285[.000]	2.6652[.010]	2.0883[.040]	-1.739[.086]	-6.1892[.000]	4.506[.000]

R-Bar-Squared	**0.73013**	Serial Correlation	CHSQ(4)=27.9910[.000]
F-stat.	41.5819[.000]	Heteroscedasticity	CHSQ(1)=3.7019[.054]
DW-statistic	0.89434		

It is also important to note that all the coefficients of the independent variables have expected signs. Depreciation (appreciation) of the local currency, rising (falling) inflation and rising (falling) U.S. interest rates will result in an increase (decrease) in financial risk premiums. On the other hand, with higher (lower) market integration and lower (higher) country risk as reflected in the Institutional Investor's country ratings, the financial risk premiums decrease (increase).

In Brazil the same five variables are found to be statistically significant in explaining the variance in the financial risk premiums as shown in Table 70. Together they predict 71% of the variance in FRP. In Brazil the relationship between financial risk premiums and inflation, market integration and country ratings are as expected. Only foreign exchange rates and the U.S. interest rates have negative sign in contrast to the expected positive relationship.

Table 70. Financial risk premium in Brazil

Brazil						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	C	FX	INF	MINT	II	USIR
Coefficient	**0.95841*** **	**-0.050274***	**2.68E-05***	**-3.1839***	**-0.011497*** **	**-2.3728** **
T-Ratio[Prob]	5.7928[.000]	-1.8697[.066]	1.7457[.085]	-1.8542[.068]	-3.2438[.002]	-2.6026[.011]

R-Bar-Squared	**0.70509**	Serial Correlation	CHSQ(4)= 40.8753[.000]
F-stat.	36.8626[.000]	Heteroscedasticity	CHSQ(1)= .29918[.584]
DW-statistic	0.57416		

In Chile four out of five explanatory variables are statistically significant and together explain 94% of the variation in financial risk premiums as shown in Table 71 (p.152). These variables are foreign exchange rates, inflation, market integration and the Institutional Investor's country ratings. Their coefficients have expected signs. Deprecation (appreciation) of the local currency and rising (falling) inflation will drive financial risk premiums up (down). Higher (lower) market integration and lower (higher) country risk, on the contrary,

will reduce (increase) financial risk premiums. The only explanatory variable, which is not statistically significant, is the U.S. interest rates.

Table 71. Financial risk premium in Chile

Chile						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	C	FX	INF	MINT	II	USIR
Coefficient	**0.55845*** **	**0.000059*** **	**0.00413***	**-1.3411*** **	**-0.00437*** **	**-0.21846**
T-Ratio[Prob]	13.5917[.000]	13.5917[.000]	1.7337[.087]	-6.4558[.000]	-11.6551[.000]	-.77717[.440]

R-Bar-Squared	**0.94239**	Serial Correlation	CHSQ(4)=50.6643[.000]
F-stat.	246.3637[.000]	Heteroscedasticity	CHSQ(1)=3.9609[.047]
DW-statistic	0.38752		

In Colombia, as shown in Table 72, foreign exchange rates, inflation, market integration and the Institutional Investors' country ratings can explain 90% of the variance in financial risk premiums. The coefficients of these explanatory variables have expected signs. Deprecation (appreciation) of the local currency and rising (falling) inflation will drive financial risk premiums up (down). Higher (lower) market integration and lower (higher) country risk, on the contrary, will reduce (increase) financial risk premiums. The U.S. interest rates is the only explanatory variable, which is not statistically significant to explain FRP.

Table 72. Financial risk premium in Colombia

Colombia						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	C	FX	INF	MINT	II	USIR
Coefficient	**0.91337*** **	**-7.48E-06**	**-0.0136*** **	**-0.00000*** **	**-0.00972*** **	**-0.12862**
T-Ratio[Prob]	15.498[.000]	-.52414[.602]	-3.9492[.000]	-6.3126[.000]	-13.276[.000]	-.41245[.681]

R-Bar-Squared	**0.9044**	Serial Correlation	CHSQ(4)= 26.7328[.000]
F-stat.	142.9105[.000]	Heteroscedasticity	CHSQ(1)= 4.2853[.038]
DW-statistic	0.90737		

In Mexico four out of five independent variables are statistically significant and together explain 89% of the variation in financial risk premiums as shown in Table 73. These variables are foreign exchange rates, inflation, market integration and the Institutional Investor's country ratings. Only three of them have the coefficients with expected signs. Deprecation (appreciation) of the local currency shows a tiny negative (positive) effect on financial risk premiums. But other relationships remain true: an increase (decrease) in inflation will result in increase (decrease) in financial risk premiums; higher (lower) market integration and lower (higher) country risk, on the contrary, will reduce (increase) financial risk premiums. The only explanatory variable, which is not statistically significant, is the U.S. interest rates.

Table 73. Financial risk premium in Mexico

Mexico						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	C	FX	INF	MINT	II	USIR
Coefficient	**0.28343****	**-6.51E-02*****	**0.0024768****	**4.6547*****	**-0.0042748****	**-0.48013**
T-Ratio[Prob]	2.5730[.012]	-7.5202[.000]	2.8053[.007]	6.8852[.000]	-2.8612[.006]	-.68654[.495]
R-Bar-Squared	**0.88882**		Serial Correlation		CHSQ(4)=33.3903[.000]	
F-stat.	120.9194[.000]		Heteroscedasticity		CHSQ(1)= 0.75711[.384]	
DW-statistic	1.0647					

In Venezuela only three variables are statistically significant in explaining the variation in financial risk premiums (See Table 74, p.154). They are inflation, market integration and the Institutional Investor's country ratings. Together they explain 77% of the variation in financial risk premiums. The coefficients of inflation and country ratings have expected signs. Market integration, however, has a positive sign. This can be explained by the fact that increased market integration resulted in increased volatility in Venezuela making the economy more vulnerable to the external shocks. Foreign exchange rates are not statistically significant.

Table 74. Financial risk premium in Venezuela

Venezuela						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	C	FX	INF	MINT	II	USIR
Coefficient	**0.14923**	**-0.000019**	**0.0080012*** **	**1.1449*** **	**-0.0005451**	**-1.6725*** **
T-Ratio[Prob]	1.216[.228]	-.9715[.335]	7.9617[.000]	3.2135[.002]	-.23338[.816]	-3.9538[.000]
R-Bar-Squared	**0.77248**		Serial Correlation		CHSQ(4)=	24.3010[.000]
F-stat.	51.9287[.000]		Heteroscedasticity		CHSQ(1)=	2.1674[.141]
DW-statistic	0.92427					

In Indonesia, as shown in Table 75, inflation, market integration and the U.S. interest rates explain 57% of the variation in the financial risk premiums. Their coefficients have expected signs. This means that rising (falling) inflation and higher (lower) U.S. interest rates will drive financial risk premiums up (down). Higher (lower) market integration, on the contrary, will reduce (increase) financial risk premiums. Foreign exchange rates and the Institutional Investor's country ratings are not statistically significant in explaining the variation in financial risk premiums in Indonesia.

Table 75. Financial risk premium in Indonesia

Indonesia						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	C	FX	INF	MINT	II	USIR
Coefficient	**-0.042341**	**7.81E-06**	**1.59E-02*** **	**-9.99E-01** **	**0.0013302**	**2.5831*** **
T-Ratio[Prob]	-.61561[.540]	1.6588[.102]	5.0338[.000]	-2.3483[.022]	1.3708[.175]	5.9745[.000]
R-Bar-Squared	**0.57178**		Serial Correlation		CHSQ(4)=	47.8177[.000]
F-stat.	21.0285[.000]		Heteroscedasticity		CHSQ(1)=	0.54912[.459]
DW-statistic	0.42009					

In Malaysia foreign exchange rates, inflation, market integration and the U.S. interest rates explain 78% in the variation of the financial risk premiums as shown in Table 76. The coefficients of inflation, foreign exchange rates and market integration have the expected signs. The U.S. interest rates have a negative sign indicating that an increase (decrease) in interest rates will result in decrease (increase) in financial risk premiums. The Institutional Investor's country ratings are not statistically significant.

Table 76. Financial risk premium in Malaysia

Malaysia						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	**C**	**FX**	**INF**	**MINT**	**II**	**USIR**
Coefficient	**0.04416*** **	**3.81E-03***	**-7.33E-03*** **	**-9.42E-02*** **	**2.74E-05**	**-0.11244****
T-Ratio[Prob]	3.5893[.001]	2.1743[.033]	-4.6993[.000]	-8.8414[.000]	.22812[.820]	-2.1885[.032]

R-Bar-Squared	**0.77829**	Serial Correlation	CHSQ(4)=47.0355[.000]
F-stat.	53.6565[.000]	Heteroscedasticity	CHSQ(1)=31.8109[.000]
DW-statistic	0.45279		

In the Philippines all five variables are statistically significant and explain 91% of the variation in financial risk premiums as shown in Table 77. The coefficients of all variables have the expected signs except for market integration, which have a tiny positive effect on financial risk premiums. The explanation is that opening up the economy might have led to the increased volatility in the Philippines.

Table 77. Financial risk premium in the Philippines

Philippines						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	**C**	**FX**	**INF**	**MINT**	**II**	**USIR**
Coefficient	**0.11885*** **	**4.16E-03*** **	**-4.64E-03*** **	**0.00E+00*** **	**-5.23E-03*** **	**1.4454*** **
T-Ratio[Prob]	3.8119[.000]	5.5925[.000]	-2.1961[.031]	-4.9924[.000]	-12.0480[.000]	5.1062[.000]

R-Bar-Squared	**0.90765**	Serial Correlation	CHSQ(4)=39.8033[.000]
F-stat.	148.4339[.000]	Heteroscedasticity	CHSQ(1)=0.064310[.800]
DW-statistic	0.53811		

In Thailand only two explanatory variables, namely foreign exchange rates and market integration, are statistically significant and can explain 66% of the variation in the financial risk premiums as shown in Table 78. Both of them have the expected signs. Depreciation (appreciation) of the local currency results in higher (lower) financial risk premiums. And higher (lower) market integration leads to lower (higher) financial risk premiums. Inflation, country ratings and the U.S. interest rates are not statistically significant in explaining the changes in financial risk premiums in Thailand.

Table 78. Financial risk premium in Thailand

Thailand						
Dependent variable is FRP						
76 obs from 1985Q1 to 2003Q4						
Regressor	C	**FX**	**INF**	**MINT**	**II**	**USIR**
Coefficient	**0.035717**	**4.08E-03*** **	**-4.92E-03**	**-8.37E-01*** **	**4.69E-04**	**0.50717**
T-Ratio[Prob]	.42252[.674]	4.0071[.000]	-.60177[.549]	-6.7924[.000]	.43544[.665]	1.5487[.126]

R-Bar-Squared	**0.65526**	Serial Correlation	CHSQ(4)=0.57869[.965]
F-stat.	29.5104[.000]	Heteroscedasticity	CHSQ(1)=0.090172[.764]
DW-statistic	1.924		

In summary, five macroeconomic variables (i.e. foreign exchange rates, inflation, market integration, the Institutional Investor's country ratings, and the U.S. interest rates) explain up to 94% of the variance in financial risk premiums (See Table 79, p.157). Market integration is statistically significant in explaining the variation in financial risk premiums in all ten countries. Inflation explains the movements of financial risk premiums in eight out of ten countries. It is not significant only in Colombia and Thailand. Foreign exchange rates are statistically significant in seven out of ten countries. They do not explain the variations in financial risk premiums only in Colombia, Venezuela and Indonesia.

Table 79. Financial risk premiums explained in Latin America and Asia Pacific

Dependant variable is FRP								
Regressor	C	FX	INF	MINT	II	USIR	R-Bar-Squared	F-stat.
Argentina	0.414***	0.068**	0.0001**	-1.7177*	-0.007	4.243***	0.730	41.58[.000]
Brazil	0.958***	-0.05*	0.000*	-3.1839*	-0.011***	-2.3728**	0.705	36.86[.000]
Chile	0.558***	0.000***	0.004*	-1.341***	-0.004***	-0.21846	0.942	246.36[.000]
Colombia	0.913***	0.000	-0.013	-0.000***	-0.009***	-0.12862	0.904	142.91[.000]
Mexico	0.283**	-0.065***	0.002**	4.654***	-0.004**	-0.48013	0.889	120.91[.000]
Venezuela	0.149	0.000	0.008***	1.145***	-0.001	-1.6725***	0.772	51.92[.000]
Indonesia	-0.042	0.000	0.016***	-0.999**	0.001	2.5831***	0.572	21.03[.000]
Malaysia	0.044***	0.004*	-0.007***	-9.42E-02***	0.000	-0.11244**	0.778	53.65[.000]
Philippines	0.118***	0.004***	-0.005**	0.00E+00***	-0.005**	1.4454***	0.908	148.43[.000]
Thailand	0.036	0.004***	-0.005	-8.37E-01***	0.000	0.50717	0.655	29.51[.000]

The Institutional Investor's country ratings are statistically significant in explaining financial risk premiums in Brazil, Chile, Colombia, Mexico and the Philippines. The relation between financial risk premiums and the Institutional Investor's country ratings will be discussed in greater detail in the next chapter. The U.S. interest rates can explain the variance in financial risk premiums in six out of ten countries. They fail to explain FRP only in Chile, Colombia, Mexico and Thailand.

These results provide evidence that financial risk premiums can substitute a set of macroeconomic variables including inflation, currency risk, country ratings, market integration and the U.S. interest rates. A further analysis has been performed to check whether there is any incremental information left in the residuals, obtained when regressing financial risk premiums on a set of macroeconomic variables. For this purpose financial risk premiums are regressed on five macroeconomic variables to obtain residuals and these residuals are included back into the regression alongside the original variables to see whether the residuals of FRP could still explain the variation in total returns on the stock market in the countries under consideration. It is very encouraging to find out that in Argentina, Chile and the Philippines, the residuals of financial risk premiums still contain information about the total returns on the stock markets in these countries.

7.5 Summary

The role and characteristics of financial risk premiums have been discussed in this chapter. It appears that financial risk premiums are one of the most important variables in explaining the behaviour of stock markets in emerging economies. The analysis of the relationship between financial risk premiums and other macroeconomic variables show that five macroeconomic variables can explain up to 94% in financial risk premiums. Moreover, financial risk premiums contain addition information about the total returns on stock markets in emerging economies. The relationship between financial risk premiums and the Institutional Investor's country ratings and the separation of country and financial risks will be discussed in the next chapter.

CHAPTER 8

Country and financial risk

8.1 Introduction

In this chapter an attempt to separate financial and country risks is undertaken. Section 8.2 presents the results of the extraction of a 'pure' financial risk in the Latin American and Asia pacific countries. Section 8.3 summarises the results of this chapter.

8.2 Country versus financial risk

In the previous chapters financial risk premiums and Institutional Investor's country ratings are proved to be the best variables in explaining the fluctuation of the stock market returns in emerging economies. However, the regression and correlation analysis results show that financial risk premiums are closely correlated with the Institutional Investor's country ratings as both variables focus on country risk. To differentiate between financial risk, captured in financial risk premiums, and country risk, proxied by the Institutional Investors' country ratings, financial risk premiums (FRP) are regressed on the Institutional Investor's country ratings (II) (or visa versa) to obtain the residuals and see whether the residuals containing a 'pure' financial risk (or country risk) will still be significant in explaining the total returns.

8.2.1 Argentina

In order to extract a 'pure' financial risk in Argentina, residuals are obtained from the regression of financial risk premiums (FRP) on the Institutional Investor's country ratings (II) as shown in Table 80.1 (Regression 1, p.160). The results of the regression show that the Institutional Investor's country ratings (II) can explain 59% of the variance in the financial risk premiums, proving that these variables are capturing a similar composition of risks. In Table 80.1 the total returns (TR) are regressed on the Institutional Investor's country ratings (II) and the 'pure' financial risk (RESFRP) in Regression 2, and on the 'pure' financial risk in

Regression 3 to see whether the 'pure' financial risk will be a significant variable in explaining the fluctuations in the total returns.

Table 80.1 Country and financial risk in Argentina

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is FRP		**Dependent variable is TR**		**Dependent variable is TR**	
76 obs from 1985Q1 to 2003Q4		75 obs from 1985Q2 to 2003Q4		75 obs from 1985Q2 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.80636***	C	0.37256**	C	0.094745**
II	-0.011087***	II	-0.0092871*	RESFRP	0.99572*
		RESFRP	1.0194*		
R-Bar-Squared	0.59187	R-Bar-Squared	0.051407	R-Bar-Squared	0.02351
DW-statistic	0.50536	DW-statistic	2.1481	DW-statistic	2.0472

In Argentina the 'pure' financial risk (RESFRP), obtained in the form of residuals after regressing FRP on II, is statistically significant at 10% confidence level both in Regression 2 and Regression 3 in Table 80.1. This means that apart from country risk, financial risk premiums also contain a financial risk factor, which is statistically significant in explaining the total returns on the stock market in Argentina. Interestingly, when the Institutional Investor's country ratings (II) are regressed on financial risk premiums (FRP) in Regression 1 in Table 80.2 (p.161), the residuals obtained from this regression, which would represent a 'pure' country risk (RESII), are not significant in explaining the variation in the total returns (TR) (see Table 80.2). This means that financial risk premium (FRP) is a more accurate variable in comparison to the Institutional Investor's country ratings (II) and it contains both financial and country risks. Moreover, when the financial risk information is deducted from the country ratings (II), the latter loses its power to predict any variations in the total returns in comparison to the original results.

Table 80.2 Country and financial risk in Argentina

Regression 1		Regression 2		Regression 3	
Dependent variable is II		**Dependent variable is TR**		**Dependent variable is TR**	
76 obs from 1985Q1 to 2003Q4		75 obs from 1985Q2 to 2003Q4		75 obs from 1985Q2 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	55.4444***	C	-0.33773*	C	0.092557*
FRP	-53.8750***	FRP	0.91086**	RESII	0.0014661
		RESII	0.0020152		
R-Bar-Squared	0.59187	R-Bar-Squared	0.051407	R-Bar-Squared	-0.01329
DW-statistic	0.36128	DW-statistic	2.1481	DW-statistic	2.0175

8.2.2 Brazil

In Brazil the Institutional Investor's country ratings (II) explain 53% in the financial risk premium (FRP(-2)), but the extracted financial risk (RESFRP) is not statistically significant in explaining the variance in the total returns (See Regression 2 and 3 in Table 81.1). Similar results are obtained when a 'pure' country risk (RESII) is extracted from the Institutional Investor's country ratings (II). It does not prove to be statistically significant as well (See Table 81.2).

Table 81.1 Country and financial risk in Brazil

Regression 1		Regression 2		Regression 3	
Dependent variable is FRP(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.87274***	C	0.42746**	C	0.068303**
II	-0.018954***	II	-0.010657*	RESFRP	0.27562
		RESFRP	0.27562		
R-Bar-Squared	0.53483	R-Bar-Squared	0.021565	R-Bar-Squared	-0.0055886
DW-statistic	0.3572	DW-statistic	2.1279	DW-statistic	2.0408

Table 81.2 Country and financial risk in Brazil

Regression 1		Regression 2		Regression 3	
Dependent variable is II		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	40.3830***	C	-0.032472	C	0.068303**
FRP(-2)	-28.5540***	FRP(-2)	0.43075*	RESII	-0.0054327
		RESII	-0.0054327		
R-Bar-Squared	0.53483	R-Bar-Squared	0.021565	R-Bar-Squared	-0.0090309
DW-statistic	0.2883	DW-statistic	2.1279	DW-statistic	2.1323

8.2.3 Chile

In Chile the Institutional Investor's country ratings (II) explain 93% in the financial risk premiums (FRP) (See Regression 1 in Table 82.1), which proves that II and FRP are capturing similar risk factors in emerging markets. However, a 'pure' financial risk (RESFRP), extracted from FRP by regressing the financial risk premiums (FRP) on the Institutional Investor's country ratings (II) in Chile, has not proved to be statistically significant in explaining the stock market returns (See Regression 2 and 3 in Table 82.1). Similar results are obtained when a 'pure' country risk (RESII) is extracted from the Institutional Investor's country ratings (II). The former does not explain any variation in the total returns (See Regression 2 and 3 in Table 82.2).

Table 82.1 Country and financial risk in Chile

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is FRP(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.37855***	C	0.25140***	C	0.070514***
II	-0.0042457***	II	-0.0037067***	RESFRP	0.51191
		RESFRP	0.51191		
R-Bar-Squared	0.93181	R-Bar-Squared	0.10082	R-Bar-Squared	-0.010812
DW-statistic	0.33864	DW-statistic	2.1569	DW-statistic	1.8898

Table 82.2 Country and financial risk in Chile

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is II		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	86.4466***	C	-0.074935	C	0.070514***
FRP(-2)	-219.6895***	FRP(-2)	0.84875***	RESII	-0.0015332
		RESII	-0.0015332		
R-Bar-Squared	0.93181	R-Bar-Squared	0.10082	R-Bar-Squared	-0.012461
DW-statistic	0.32648	DW-statistic	2.1569	DW-statistic	1.9254

8.2.4 Colombia

In Colombia the Institutional Investor's country ratings (II) explain 49% in the variance of the financial risk premiums as shown in Regression 1 in Table 83.1. The extracted financial risk is found to be insignificant to explain the fluctuations of the Colombian stock market (See Regression 2 and 3 in Table 83.1). When a 'pure' country risk (RESII) is extracted from the Institutional Investor's country ratings (II), it loses its explanatory power (see Table 83.2), despite the fact that the Institutional Investor's country ratings (II) originally could explain 5% of the variance in the total returns on the stock market in Colombia.

Table 83.1 Country and financial risk in Colombia

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is FRP(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.81883***	C	0.73576***	C	0.060976**
II(-2)	-0.012279***	II(-2)	-0.016516**	RESFRP	0.65299
		RESFRP	0.65299		
R-Bar-Squared	0.49328	R-Bar-Squared	0.077582	R-Bar-Squared	0.0059865
DW-statistic	0.21972	DW-statistic	2.0915	DW-statistic	1.904

Table 83.2 Country and financial risk in Colombia

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is II(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	53.7751***	C	-0.25591**	C	0.060976**
FRP(-2)	-40.7370***	FRP(-2)	0.99918***	RESII	-0.0084982
		RESII	-0.0084982		
R-Bar-Squared	0.49328	R-Bar-Squared	0.077582	R-Bar-Squared	-0.002721
DW-statistic	0.20897	DW-statistic	2.0915	DW-statistic	1.9154

8.2.5 Mexico

In Mexico a 'pure' financial risk (RESFRP), extracted from the financial risk premiums (FRP) by regressing FRP on the Institutional Investor's country ratings (II) (Regression 1), does not prove to be a statistically significant variable (See Table 84.1). However, when a 'pure' country risk (RESII) is extracted from the Institutional Investor's country ratings (Regression 1 in Table 84.2), it is statistically significant at 5% confidence level. The 'pure' country risk together with the financial risk premiums in Mexico explain 8% of the variance in the total returns on the stock market (See Regression 2 in Table 84.2).

Table 84.1 Country and financial risk in Mexico

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is FRP		**Dependent variable is TR**		**Dependent variable is TR**	
76 obs from 1985Q1 to 2003Q4		75 obs from 1985Q2 to 2003Q4		75 obs from 1985Q2 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.89697***	C	0.41293***	C	0.079947***
II	-0.014620***	II	-0.0078290***	RESFRP	-0.45893
		RESFRP	-0.45698		
R-Bar-Squared	0.79094	R-Bar-Squared	0.08214	R-Bar-Squared	0.0036759
DW-statistic	0.21761	DW-statistic	2.364	DW-statistic	2.1489

Table 84.2 Country and financial risk in Mexico

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is II		**Dependent variable is TR**		**Dependent variable is TR**	
75 obs from 1985Q2 to 2003Q4		75 obs from 1985Q2 to 2003Q4		75 obs from 1985Q2 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	57.4614***	C	-0.010929	C	0.080104***
FRP	-54.3225***	FRP	0.33124*	RESII	-0.014510**
		RESII	-0.014510**		
R-Bar-Squared	0.7906	R-Bar-Squared	0.08214	R-Bar-Squared	0.050897
DW-statistic	0.21328	DW-statistic	2.364	DW-statistic	2.2664

8.2.6 Venezuela

The financial risk premiums (FRP) are not statistically significant in explaining the total returns in Venezuela. According to the regression results in Regression 1 (Table 85.1) the second lag of the Institutional Investor's country ratings (II(-2)) explains only 18% in the variance of FRP(-2). The financial risk (RESFRP), extracted in the form of the residuals from the financial risk premiums (FRP) by regressing FRP on the Institutional Investor's country ratings (II), has no explanatory power similar to the original variable (Regression 2 and 3 in Table 85.1). When a 'pure' country risk (RESII) is extracted from the Institutional Investor's country atings (II), it is statistically significant at 1% confidence level (See Regression 2 and 3 in Table 85.2). However, it should be noted that due to the fact that FRP(-2) explains only 18% of the variance in II(-2), the extracted country risk (RESII) would be very close to the original II(-2).

Table 85.1 Country and financial risk in Venezuela

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is FRP(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.65789***	C	1.3118***	C	0.054952*
II(-2)	-0.012225***	II(-2)	-.035622***	RESFRP	-0.39086
		RESFRP	-.39086		
R-Bar-Squared	0.1813	R-Bar-Squared	0.097821	R-Bar-Squared	-0.0051709
DW-statistic	0.27014	DW-statistic	1.826	DW-statistic	1.6353

Table 85.2 Country and financial risk in Venezuela

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is II(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	38.8505***	C	-0.6402E-3	C	0.054952**
FRP(-2)	-15.7482***	FRP(-2)	0.24537	RESII	-0.040400***
		RESII	-0.040400***		
R-Bar-Squared	0.1813	R-Bar-Squared	0.097821	R-Bar-Squared	0.1061
DW-statistic	0.30587	DW-statistic	1.826	DW-statistic	1.8193

8.2.7 Indonesia

In Indonesia the Institutional Investor's country ratings (II) are not statistically significant in explaining the variation in the total returns (TR), however they explain 12% of the variation in the financial risk premiums (FRP) (See Regression 1 in Table 86.1). The extracted financial risk in the form of the FRP residuals might resemble very closely the financial risk premium (FRP) itself. As expected, the regression results are close to those of the original FRP, but apparently considerably improved. On the other hand, Institutional Investor's country ratings (II) in Indonesia, stripped of the financial risk component, has no explanatory power (See Regression 2 and 3 in Table 86.2).

Table 86.1 Country and financial risk in Indonesia

Regression 1		**Regression 2**		**Regression3**	
Dependent variable is FRP(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
70 obs from 1986Q3 to 2003Q4		63 obs from 1988Q2 to 2003Q4		63 obs from 1988Q2 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.036558	C	0.15032	C	0.073869*
II(-2)	0.0022602***	II(-2)	-0.0018106	RESFRP	1.6041**
		RESFRP	1.5856**		
R-Bar-Squared	0.1264	R-Bar-Squared	0.043575	R-Bar-Squared	0.055995
DW-statistic	0.20257	DW-statistic	2.2468	DW-statistic	2.2245

Table 86.2 Country and financial risk in Indonesia

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is II(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
63 obs from 1988Q2 to 2003Q4		63 obs from 1988Q2 to 2003Q4		63 obs from 1988Q2 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	34.5734***	C	-0.094142	C	0.062954
FRP(-2)	61.6035***	FRP(-2)	1.2533*	RESII	-0.0053943
		RESII	-0.0053943		
R-Bar-Squared	0.1071	R-Bar-Squared	0.043575	R-Bar-Squared	0.0091002
DW-statistic	0.057074	DW-statistic	2.2468	DW-statistic	2.184

8.2.8 Malaysia

The Institutional Investor's country ratings (II) and financial risk premiums (FRP) have nothing in common in Malaysia as the Institutional Investor's country ratings explain only 1% of the variation in financial risk premiums and vice versa (See Regression 1 in Table 87.1). Therefore, a 'pure' financial risk (RESFRP), extracted from the financial risk premiums (FRP), is expected to be not statistically significant as it closely resembles the original FRP. Similarly, a 'pure' country risk, extracted from the Institutional Investor's country ratings (II), resemble the original variable and is statistically significant in explaining the total returns (See Regression 2 and 3 in Table 87.2).

Table 87.1 Country and financial risk in Malaysia

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is FRP		**Dependent variable is TR**		**Dependent variable is TR**	
72 obs from 1986Q1 to 2003Q4		72 obs from 1986Q1 to 2003Q4		72 obs from 1986Q1 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.021299*	C	0.48115*	C	0.026623
II	-0.2779E-3	II	-0.0074763*	RESFRP	-0.63920
		RESFRP	-0.63920		
R-Bar-Squared	0.012707	R-Bar-Squared	0.013135	R-Bar-Squared	-0.013446
DW-statistic	0.03387	DW-statistic	2.2407	DW-statistic	2.1525

Table 87.2 Country and financial risk in Malaysia

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is II		**Dependent variable is TR**		**Dependent variable is TR**	
72 obs from 1986Q1 to 2003Q4		72 obs from 1986Q1 to 2003Q4		72 obs from 1986Q1 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	61.2177***	C	0.026209	C	0.026623
FRP	-95.7680	FRP	0.093803	RESII	-0.0076539*
		RESII	-0.0076539*		
R-Bar-Squared	0.012707	R-Bar-Squared	0.013135	R-Bar-Squared	0.027214
DW-statistic	0.11443	DW-statistic	2.2407	DW-statistic	2.2407

8.2.9 The Philippines

In the Philippines a 'pure' financial risk (RESFRP), obtained in the form of residuals after regressing financial risk premiums (FRP) on the Institutional Investor's country ratings (II), is statistically significant at 10% confidence level (See Table 88.1). It means that apart from country risk, financial risk premiums (FRP) also contain a 'pure' financial risk, which is statistically significant in explaining the total returns. Interestingly, when the Institutional Investor's country ratings (II) are regressed on financial risk premiums (FRP), the residuals obtained from this regression, which would represent a 'pure' country risk, are not statistically significant in explaining the variation in the total returns on the stock market in the Philippines (see Table 88.2). This means that financial risk premiums (FRP) are more efficient variable in comparison to the Institutional Investor's country ratings (II) and the former contain both financial and country risk information.

Table 88.1 Country and financial risk in the Philippines

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is FRP(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.31192***	C	0.36782***	C	0.058106**
II	-0.0057168***	II	-0.0093174***	RESFRP	2.3923*
		RESFRP	2.3923*		
R-Bar-Squared	0.8901	R-Bar-Squared	0.14679	R-Bar-Squared	0.021923
DW-statistic	0.3621	DW-statistic	2.0279	DW-statistic	1.7703

Table 88.2 Country and financial risk in the Philippines

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is II		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	52.2506***	C	-0.15063**	C	0.058106**
FRP(-2)	-155.9615***	FRP(-2)	1.7125***	RESII	0.0043590
		RESII	0.0043590		
R-Bar-Squared	0.8901	R-Bar-Squared	0.14679	R-Bar-Squared	-0.010645
DW-statistic	0.34035	DW-statistic	2.0279	DW-statistic	1.7453

8.2.10 Thailand

In Thailand the Institutional Investor's country ratings (II) are not statistically significant in explaining the variation neither in the total returns (TR) nor in the second lag of financial risk premiums (FRP(-2)) (See Regression 1 in Table 89.1). In this case the residuals of the financial risk premiums (FRP) closely resemble the FRP itself and the regression results are close to those of the original FRP. On the other hand, the Institutional Investor's country ratings (II), stripped of the financial risk component, have no explanatory power (See Regression 2 and 3 in Table 89.2).

Table 89.1 Country and financial risk in Thailand

Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is FRP(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.047260	C	0.49817*	C	0.050834*
II	-0.1909E-3	II	-0.0079248	RESFRP	1.4861**
		RESFRP	1.4861**		
R-Bar-Squared	-0.013312	R-Bar-Squared	0.073379	R-Bar-Squared	0.055447
DW-statistic	0.69705	DW-statistic	2.357	DW-statistic	2.3239

Table 89.2 Country and financial risk in Thailand

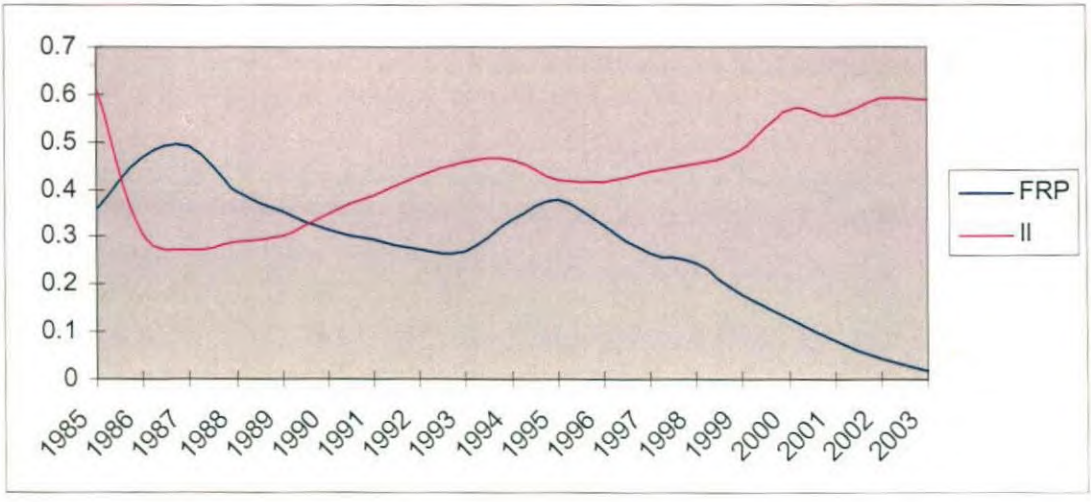
Regression 1		**Regression 2**		**Regression 3**	
Dependent variable is II		**Dependent variable is TR**		**Dependent variable is TR**	
74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4		74 obs from 1985Q3 to 2003Q4	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	56.5560***	C	-0.0042191	C	0.050834**
FRP(-2)	-2.9800	FRP(-2)	1.5089**	RESII	-0.0076411
		RESII	-0.0076411		
R-Bar-Squared	-0.013312	R-Bar-Squared	0.073379	R-Bar-Squared	0.01473
DW-statistic	0.068636	DW-statistic	2.357	DW-statistic	2.3976

The extraction of financial risk by removing the country risk from financial risk premiums has proved to be suceessful in Argentina, Indonesia, the Philippines, and Thailand. The extraeted financial risk has no explanatory power in Brazil, Chile, Colombia, Mexieo and Malaysia. However, it is interesting to note that the extracted eountry risk proved to be a

statistically significant variable only in Mexico. In Venezuela and Malaysia the country risk performs better only because the financial risk premiums in these countries have no explanatory power.

With annual data the extraction of the financial risk from FRP by separating the country risk proved to be particularly successful in Argentina and Chile and with moderate improvements in the results in Colombia, Philippines and Venezuela. In Indonesia and Thailand the financial risk premium and the 'pure' financial risk prove to be very powerful variables in explaining the variation in the total returns, while the Institutional Investors' country ratings failed to explain the behaviour of the stock markets in these countries. In Mexico it appears that the Institutional Investor's country ratings (II) and financial risk premiums (FRP) are closely resemble each other as shown on Graph 8. It means that they are capturing similar risks and it is difficult to separate financial and country risks.

Graph 8. Financial risk premium (FRP) and Institutional Investors' country ratings (II) in Mexico



The extraction of financial risk from the FRP proved unsuccessful in Malaysia and Brazil. In Malaysia this can be explained by the fact that the financial risk premium itself failed to explain the fluctuations in the stock market returns in this country.

8.3 Summary

In this chapter an attempt to separate financial and country risks has been undertaken with the successful results in four out of ten countries, namely Argentina, the Philippines, Indonesia and Thailand (on a quarterly basis). In these countries the extracted 'pure' financial risk remains a significant variable to explain the fluctuations in the stock market returns. This gives additional evidence that financial risk premiums are more accurate variables to explain the stock market behaviour in comparison to the Institutional Investor's country ratings and other variables considered in this research. On an annual basis the successful results are obtained in five out of ten countries, namely Argentina, Chile, Venezuela, Indonesia and Thailand.

CHAPTER 9

Conclusions

9.1 Introduction

This chapter summarises the results of this research. Section 9.2 re-examines the characteristics of the emerging markets such as high volatility and non-normality of the stock market returns. Section 9.3 presents the empirical results with stationary time series and discusses the U.S. interest rates, market integration and inflation, and their role in explaining the fluctuations in the stock markets in the Latin American and Asia Pacific countries. Empirical results with non-statitionary time series are presented in Section 9.4 and financial risk premiums and the Institutional Investor's country ratings are given special attention. Section 9.5 discusses the results of the extraction of a 'pure' financial risk and whether it still remains a significant variable. Section 9.6 summarises the chapter and areas of further research are discussed in Section 9.7.

9.2 The main characteristics of emerging markets

It is widely accepted in the literature that the returns in emerging markets are highly volatile (Bekaert et al, 2003; Bekaert, 1999; Bekaert et al, 1998, Aggawal et al, 2001, Santis et al, 1997, Barry et al, 1998) and not normally distributed (Harvey, 1995a; Claessens et al, 1995). This has proved to be true for most of the countries in the sample within the time period from 1985 to 2003. High volatility is present in all countries in the sample, while total returns are normally distributed only in five out of ten countries.

9.2.1 High volatility and non-normality of stock returns

The highest average returns between 1986 and 2003 have been experienced by Venezuela (37%) followed by Argentina (35%) and Philippines (35%). The lowest average total returns in the sample have been recorded for Malaysia (10%) and Thailand (18%). While Venezuela experienced the maximum returns of 602% in 1991, Thailand suffered the minimum returns

of –79% together with Indonesia (-74%) and Malaysia (-72%) in 1998, the year after the Asian countries were hit by the full-blown financial crisis. The most volatile total stock returns were those of Venezuela with the standard deviation of 149% followed by Argentina (106%) and Philippines (99%), while Malaysia had the least volatile stock returns with the standard deviation of 36%. However, when the means are compared, the mean of the total returns in Latin America is not statistically different from Asia Pacific. In five out of ten countries in the sample the equity returns exhibit non-normality, while the total returns in the other five countries are normally distributed.

9.2.2 Correlations within and between Latin America and Asia Pacific

There are strong positive correlations among the Latin American countries except for Venezuela, with Mexico being correlated with all the other four countries. Venezuela, on the contrary, is not correlated with any of the Latin American countries and none of the Asian Pacific countries either. The Latin American countries are correlated with the Asian Pacific region only in two countries: Indonesia (with Mexico) and the Philippines (with Chile and Colombia).

The Asian Pacific countries are highly correlated between each other with the correlation being positive. Thailand, for instance, is correlated with the other three Asian Pacific countries and Indonesia is correlated with Malaysia. Notably, the Philippines, being correlated with two Latin American countries, are correlated only with Thailand among the Asian Pacific economies.

9.3 Empirical results with stationary time series

Most of the explanatory variables have been found non-stationary. The level of the financial risk premium (FRP) is stationary only in Thailand; in other nine countries the financial risk premiums become stationary after taking the first difference. Foreign exchange rate (FX), market integration (MINT), Institutional Investor's country ratings (II) and the U.S. interest

rates (USIR) are integrated of order 1, i.e. they become stationary after taking the first difference. Inflation (INF) is found stationary at the level only in two countries (Indonesia and the Philippines). In the other eight countries the first differences of inflation are stationary.

After resolving the problem with the non-stationarity and taking the first differences when necessary, the multivariate linear regression analysis shows that the main determinants of the emerging stock markets are the U.S. interest rates, market integration and inflation. The U.S. interest rates can explain the variance of the equity returns in two Latin American countries (Mexico and Brazil) and three Asian markets (Indonesia, Malaysia and Thailand). Market integration and inflation also play a significant role, while the Institutional Investor's country ratings and financial risk premiums are significant only in two countries (in Thailand and Colombia respectively). Market integration (MINT) is a significant variable in explaining the behaviour of the stock markets in Colombia, Mexico and Indonesia. Inflation can explain the variance in the stock returns in Colombia, Malaysia and Thailand. The first difference of the Institutional Investor's country ratings is statistically significant only in Thailand and the first difference of the financial risk premium can explain the variance in the total returns on the Colombian stock market. The role of these variables in explaining the performance of equity markets in emerging economies are discussed below in greater detail.

9.3.1 The U.S. interest rates

The U.S. interest rates were steadily declining throughout the sample period, being as high as 10.6% in 1985 and falling down as low as 4% in 2003. It is believed that when U.S. interest rate are low it becomes more attractive for foreign investors to invest abroad (see for example Chuchan, 1998). The borrowing becomes cheaper and interest income is less attractive. At the same time high yields in emerging markets look more lucrative. Also low U.S. interest rates make borrowing for emerging market less expensive and substantially improve their

creditworthiness reducing the risk of default and brightening the economic prospects in these countries.

The first differences of the U.S. interest rates in the environment of falling interest rates should be expected to have a positive sign. This means that the negative changes in the U.S. interest rates should lead to higher total returns in the emerging markets. This proves to be true in five countries (Brazil, Mexico, Indonesia, Malaysia and Thailand), where the first difference of the U.S. interest rates is a statistically significant variable (with a positive sign) in explaining the behaviour of the stock markets.

It is interesting to note that in four out of six Latin American countries (Argentina, Chile, Colombia and Venezuela) the U.S. interest rates have no explanatory power despite the geographical proximity and a leading economic and financial role of the U.S. in the region. They are statistically significant in explaining the stock market returns only in Brazil and Mexico. On the other hand, the U.S. interest rates are a powerful explanatory variable in three out of four Asian pacific economies in the sample, namely Indonesia, Malaysia and Thailand. Only in the Philippines the coefficient of the U.S. interest rates is not statistically significant in explaining the stock market returns.

9.3.2 Inflation

The difference between inflation rates in Latin America and Asia Pacific is striking. The average annual inflation in the Latin American countries over the sample period was 175% in comparison to a tiny 6% in the Asian Pacific countries. While in Brazil the average inflation rate was 585% and in Argentina 362%, Malaysia enjoyed an average inflation rate of 2.6% and Thailand of only 3.7%.

Inflation rates and to be more precise, the first difference of inflation rates, proved to be a significant variable in explaining the stock market returns in Colombia, Malaysia and

Thailand. In all three countries the coefficients of the first difference of inflation rates have a negative sign. This means that in countries with falling inflation rates, the total returns are expected to rise. With rising inflation rates, the returns are expected to decline. In Colombia and Malaysia the inflation rates were falling during the period under consideration, and only in Thailand the inflation rates were rising.

These results coincide with the majority of the previous studies, which show that the relationship between inflation and expected returns is negative (Erb et al, 1995; Cutler et al, 1989; Gultekin, 1983). Boudoukh and Richardson (1993) argue that inflation and stock returns are positively correlated only in the long term, but not in the short term. However, according to the Fisher hypothesis, the higher rate of inflation should be reflected in a higher rate of expected returns and therefore the relationship between inflation and total returns should be positive.

It is interesting that when using the quarterly data inflation rates explain the fluctuations in equity returns in the markets with the most stable and lowest average inflation rates in the whole sample. When the analysis is repeated with annual data, inflation can explain the fluctuation of the stock returns only in Argentina.

9.3.3 Market integration

The trade sector (i.e. exports plus imports) as a proportion of GDP is used as a proxy of market integration. The increased market integration (MINT) in emerging markets should theoretically lead to lower total returns and lower diversification benefits. This is because when economies become more integrated with the world markets, the presence and participation of an increasing number of foreign investors make these economies more transparent, more informationally efficient and regulated.

It appears that average market integration is considerable higher in four Asian Pacific countries (0.97) in comparison to six Latin American countries (0.38). In Asia among four export-oriented economies Malaysia has the highest level of market integration (1.7) and only Indonesia has considerably lower market integration in comparison to its neighbours. In Latin America the least integrated economy is Argentina (0.21) and the highest average level of market integration is achieved by Chile (0.60).

As mentioned above theoretically market integration should decrease the expected returns. This is also supported by empirical results. For instance, Bekaert and Harvey (2002) find a sharp drop in average market returns in 20 emerging markets. Hence, the level of market integration is expected to have a negative sign. Moreover, taking into account that market integration was increasing in most of the emerging markets, the first difference of the market integration should be negative, indicating that positive differences in market integration should lead to lower returns.

When using quarterly data the first difference of the market integration has a negative sign in Mexico, Indonesia and Colombia, where it has some power to explain the total returns. It means that while these markets were integrating with the wider financial world, their stock markets became more efficient and regulated, which consequently led to lower overall returns. When annual data is used in the analysis, market integration is not statistically significant in explaining the stock market performance across the sample.

9.3.4 Concluding remarks

Analysing the results with stationary time series, it is important to note that the variables, which proved to be significant in explaining the stock market fluctuations, might not be the best measures of risks borne by emerging markets. It was mentioned earlier that the falling U.S. interest rates make emerging markets more attractive to the international investors and encourage capital inflows. But in this case their role to explain underlying risks might be

limited. On the other hand, lower U.S. interest rates make borrowing for emerging markets less expensive and substantially improve their creditworthiness reducing the risk of default. Therefore, the U.S. interest rates may have an effect on the risk composition in emerging markets. However, it would be expected that this risk would be best captured by financial risk premiums, derived from country default risk.

So, the question remains open whether the falling U.S. interest rates have only stimulated new capital inflows, improved considerably liquidity and driven the stock prices up, or whether they have also improved the creditworthiness of these markets reducing the risk of default. It also might be a combination of both. However, considering that the U.S. interest rates can explain stock market fluctuations only in two Latin American countries (Mexico and Venezuela), in the region with high country default risk, and in three Asian markets (Indonesia, Malaysia and Thailand), in the region with considerably lower country default risk, as reflected in the country ratings and financial risk premiums, the U.S. interest rates might not be the best measure of the country default risk and might be only indicative of increased (decreased) capital inflows (outflows).

It is also important to note that inflation rates explain the fluctuations in the equity returns in the markets with the most stable and lowest average inflation rates in the whole sample. Market integration is a significant variable in explaining the behaviour of the stock markets only in Colombia, Mexico and Indonesia.

These results, although encouraging, do not fully answer the question of what market fundamentals and underlying risks affect the stock markets in emerging economies and further analysis is undertaken in the following chapters.

9.4 Empirical results with non-stationary time series

Most of the explanatory variables, used in this research, have been found non-stationary. This indicates that these time series do not revert to their means over time and thus, past performance does not predict future performance. Although the results, obtained when using nonstationary time series, are valid within the time period under consideration (Gujarati, 2003), the analysis has shown some interesting findings and better understanding of what really drives the emerging markets.

Summarising the results of the factor analysis and model selection, it appears that the Institutional Investor's country ratings and financial risk premiums are the best determinants of the stock market performance in ten Latin American and Asian Pacific countries in the sample. The level or the second lag of the financial risk premium is a statistically significant variable in explaining the variance in the stock returns in eight out of ten countries (Argentina, Brazil, Chile, Colombia, Mexico, Indonesia, Thailand and the Philippines). The closest rival variable, Institutional Investor's country ratings, explains the fluctuations in the stock markets in four out of ten countries (Brazil, Chile, Venezuela and Malaysia). Inflation is a significant variable in Thailand. The findings regarding financial risk premiums and the Institutional Investor's country ratings are discussed in greater detail below.

9.4.1 Financial risk premium

The means of the financial risk premiums in Latin America and Asia Pacific are statistically different, supporting the assumption that these two regions might have different risk profiles. Also the coefficients of the financial risk premium (FRP) are considerably higher in Asian countries in comparison to Latin American countries, indicating that the marginal increase in financial risk premiums in Asia results in considerably higher returns.

The regression results with the quarterly data show that the financial risk premium is statistically significant in explaining the stock market returns in all countries except for

Venezuela and Malaysia. In Argentina and Mexico the level of the financial risk premium is the best variable in the set of the variables under consideration, which explains 6% and 3% of the variance in the stock market returns respectively. In Brazil and Chile the second lag of financial risk premium (FRP(-2)) and Institutional Investor's country ratings are two main rival variables, which explain 3% and 2% of the variance in the stock market returns respectively. In Colombia the second difference of financial risk premium (FRP(-2)) together explains 9% of the variations in the total returns. The financial risk premium in Venezuela is not statistically significant.

In Indonesia the second lag of financial risk premium (FRP(-2)) together with market integration (MINT) are statistically significant variables and explain 12% of the variance in the total returns. The financial risk premium is not significant in Malaysia. The second lag of the financial risk premium (FRP(-2)) explains 15% of the variance of the stock market returns in the Philippines. In Thailand the second lag of the financial risk premium together with inflation (INF) explain 11% in the fluctuations of the stock market. The financial risk premiums explain between 3% and 15% of the variance in the quarterly total returns on the stock markets across eight out of ten countries.

It is very important to note that when the regression analysis is repeated with annual data, the same results are obtained. Financial risk premium is statistically significant in all countries in the sample except for Venezuela and Malaysia. It can explain between 14% and 50% of the annual fluctuations in the stock markets in the ten sample countries. These results give strong evidence that financial risk premiums do a superior job in explaining the behaviour of the stock markets in emerging economies in comparison to other variables, considered in this research. It also shows that financial risk premiums can incorporate information, contained in other macroeconomic variables like exchange and inflation rates, and they also outperform Institutional Investor's country ratings, the main rival variable.

9.4.2 Financial risk premiums and other macroeconomic variables

The financial risk premium is found to have a very strong negative correlation with foreign exchange rates in four countries; a strong positive correlation with inflation and market integration in four countries; a strong negative correlation with Institutional Investor's country ratings in six countries; positive correlation with GDP in three countries; and a strong positive correlation with the U.S. interest rates in six countries. The fact, that the financial risk premiums are highly correlated with other variables and the former can effectively substitute the latter according to the results of the factor analysis, proves that the financial risk premiums incorporate risks, contained in other variables.

In summary, five macroeconomic variables (i.e. foreign exchange rates, inflation, market integration, the Institutional Investor's country ratings, and the U.S. interest rates) explain up to 94% of the variance in financial risk premiums. Market integration is statistically significant in explaining the variation in financial risk premiums in all ten countries. Inflation explains the movements of financial risk premiums in eight out of ten countries. It is not significant only in Colombia and Thailand. Foreign exchange rates are statistically significant in seven out of ten countries. They do not explain the variations in financial risk premiums only in Colombia, Venezuela and Indonesia. The Institutional Investor's country ratings are statistically significant in explaining financial risk premiums in Brazil, Chile, Colombia, Mexico and the Philippines. The U.S. interest rates can explain the variance in financial risk premiums in six out of ten countries. They fail to explain FRP in Chile, Colombia, Mexico and Thailand.

These results provide evidence that financial risk premiums can substitute a set of macroeconomic variables including inflation, currency risk, country ratings, market integration and the U.S. interest rates. A further analysis has been performed to check whether there is any incremental information left in the residuals, obtained when regressing

financial risk premiums on the set of macroeconomic variables. For this purpose financial risk premiums have been regressed on the above-mentioned macroeconomic variables to obtain residuals and these residuals are included into the regression alongside the original variables to see whether the residuals of FRP would still explain the variation in the total returns. The findings are very encouraging and show that in Argentina, Chile and the Philippines, the residuals of financial risk premiums still contain information about the total returns on the stock markets.

9.4.3 Institutional Investor's country ratings

Another important determinant of the stock market performance is the Institutional Inverstor's country ratings. The Institutional Investor's country ratings explain between 2% and 11% of the fluctuations in the stock markets in four out of ten countries (Brazil, Chile, Malaysia, and Venezuela). Country ratings are expected to be consistent with the basic economic fundamentals and this is mainly true in the sample countries with only few exceptions. It is found that the Institutional Investor's country ratings are correlated more with foreign exchange rate rather than with stock market returns. The country ratings exhibit a significant correlation with foreign exchange rates in eight out of ten countries. Institutional Investor's country ratings are also significantly correlated with inflation and the U.S. interest rates.

Surprisingly, there is no correlation between Institutional Investor's country ratings and GDP. Although GDP growth is one of the main parameters in assessing the economic situation in a country and an important determinant of credit ratings (Cantor and Packer, 1996; Cosset and Roy, 1991), there is almost no evidence that Institutional Investor's country ratings are correlated with the GDP growth in emerging economies in the sample. The country ratings are correlated with the GDP growth only in Thailand (54%) and Venezuela (58%).

The Institutional Investor's country ratings for Indonesia, Thailand and the Philippines have no explanatory power in explaining the equity returns. This supports the view that credit agencies failed to anticipate the Asian crisis and their techniques to assess the county risk in Asian economies did not prove to be successful.

9.5 Country and financial risks

The attempt to separate the financial and country risks has been undertaken with successful results in four out of ten countries, namely Argentina, Indonesia, the Philippines, and Thailand. In these countries the extracted 'pure' financial risk remains a significant variable to explain the fluctuations in the stock market returns. It is important to note that the 'pure' financial risk can explain the variance in the total returns on the stock markets in three out of four Asia Pacific countries. It gives more evidence to the fact that financial risk premiums outperform the Institutional Investor's country ratings in Asia Pacific and can assess the country default risk more efficiently.

It is interesting to note that the extracted country risk proved to be a significant variable only in Mexico. In Venezuela and Malaysia the country risk performs better only because the financial risk premiums in these countries originally had no explanatory power. This gives even stronger evidence that financial risk premiums are superior variables in comparison to the Institutional Investor's country ratings and other variables. When the analysis is repeated with annual data the successful results are obtained in five out of ten countries, namely Argentina, Chile, Venezuela, Indonesia and Thailand.

9.6 Conclusions

The findings show that financial risk premiums are an important risk factor, which successfully explains the performance of stock markets in emerging economies. Moreover, financial risk premiums appear to be an aggregate risk factor, which can successfully replace

five macrocconomic variables, and above that, they contain more specific information, which successfully explains the variance in the stock market returns.

The findings may have significant implications for investors in their investment dccision making and for national policymakers. The findings highlight the significance of the country default risk in explaining the stock market movements in the Latin American and Asia Pacific economies. One of the important practical applications is the improvement of investors' portfolio performance and a better understanding of risk-return relationships in emerging markets. The results also support that there are differences in risk-return relationship in two regions.

The findings also give national policy makers a better understanding of the relationship between country dcfault risk and its effect on the stock market performance. One of the important implications for national policy makers is the understanding that the fiscal and monetary health of the country has a great significance for the stock market. And importance of this is emphasized by the fact that stock markets became one of the most important sources of capital in emerging economies. Another implication both for policy makers and investors is that the widely accepted and widely-used country fundamentals might not give the best results when analysing the performance of the stock market.

9.7 Further research

As emerging markets become more integrated there is a need for more research and understanding of the effect of global market risks on emerging markets and correlation between developed and emerging markets. Taking into account the increasing importance of emerging markets in the world financial market (espccially the increasing importance of China in the last decade) it is vital to understand what effect emerging stock markets might have on the world financial stability.

It would be very interesting to repeat this study with more recent observations. It also would be very valuable to compare actual yield spreads and financial risk premiums to find any significant similarities or differences. Another application would be in the calculation of the implied collateral for emerging markets' external debt if the financial risk premiums are substituted by sovereign bond yield spreads.

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APPENDIX I

Mexico

Time period/Date	State/Event
1979-1982	Mexico debt increased from $50 billion to $90 billion, which was about 60% of GDP or 335% of annual exports.
1981-82	The price of oil fell and the US went into regression. Mexican revenues fell and the dollar denominated national debt became more expensive. Mexico exhausted its foreign reserves and defaulted on its external obligations. The market fell by 87 per cent.
1980s	Economic decline and high inflation. The overvaluation of the peso as it was fixed against the dollar.
mid-1980s	Structural reforms
August 1982	The Mexican government declared a moratorium on its debt payment.
1985	An earthquake in the Mexico city. The government adopted a strict fiscal adjustment programme (2).
1986	Oil prices collapsed
1985-87	Peso devaluated by 45%.
December 1987	The inflation rate was at 160% level. The Economic Solidarity Pact was enacted to freeze the wages and prices.
1989	The revision of the 1973 Law to Promote Mexican Investment and Regulate Foreign Investment relaxed restrictions on foreign ownership and allowed foreign investors to own up to 100% in 73% of Mexican listed companies.
August 1989	Mexico was a first country to negotiate its debt according to the Brady Plan. The reduction of its total debt was less than 15 percent. (2)
Early 1990s	Recovering economic growth and price stability
	Privatisation
	Introduction of Brady bonds, reduction in domestic and external public debt.
1994	Political turmoil and violence: an armed uprising by the Zapatistas in January (on the day NAFTA came into effect), the assassination of the presidential candidate in March.
End of 1994	Financial crisis: devaluation of peso, the Mexican government is unable to roll over its debt. The current account deficit was at around 6 percent. (2)
Early 1995	International rescue package
1995	GDP fell by 7%
2000	By 2000 Mexico accounted for half of all Latin America' exports. (4)
2001	Because of high dependence on the exports with 25 percent of its GDP in exports and 85 percent of its exports going to the United States, Mexico went into recession as a result of the economic slowdown in the U.S.
2003	Largest stock market in Latin America measured by market capitalisation

Brazil

Time period/Date	State/Event
1978-1987	Decreasing profitability of the state-owned corporations.
1985	The democratic government, that took power in March 1985, launched several social programmes aimed at the distribution of income and made social expenditures as its main priority. The state indebtedness was very high with internal debt representing 48% of GDP. (2)
1986	The collapse of the Cruzado Plan.
February 1997	Brazil announced a moratorium on its external debt.
1987-89	The Bresser Plan (1987) and the Summer Plan (1989) were not able to eliminate inflation. (2)
1988	Brazil's external an internal public debt corresponded to more than 50 percent of GDP. The government turned to securitisation of the old debt with a guarantee provided by the multilateral agencies in order to reduce the debt. (2)
1989-1990	The GDP growth was negative.
1990	Inflation was at 2749% going down in the following years. The Collor Plan was aimed to bring the inflation down, but failed.
1990s	The role of private sector has become strategic.
May 1991	Under Resolution 1832 foreign investors were allowed to own up to 49% of voting stock and 100% of nonvoting stock. Only voting stock in oil companies and banks cannot be owned by foreigners.
1992	An economic programme, monitored by the IMF pushed real interest rates to 4% a month and led the economy into a deep recession without reducing inflation but keeping it stable (2). The president, charged with corruption, was impeached.
1994	The Real Plan stabilized prices. Inflation reached another high point of 2075% falling sharply that year as a result of the Real Plan. Brazil signed a Brady agreement.
Late 1990s	Brazil became the largest recipient of DFI in the developing world apart from China. DFI was large enough to cover almost all financing needs (4).
January 1999	The devaluation of real.

Argentina

Time period/Date	State/Event
1983	The external debt was 77.3 per cent of GDP in 1983 and remained around this level during the subsequent years.
June 1985	The Austral Plan was launched to stop inflation with a shock stabilisation by a shift towards fiscal-monetary balance, a rigid incomes policy (e.g. freezing of wages and prices) and monetary reform.
July 1985	The wholesale prices dropped below their nominal terms and the purchasing power of wages was improved by sudden drop in inflation.
1986	It was necessary to end the freeze on prices and wages and inflation was increasing again.
1987	The cereal prices were 35 percent lower than in 1984 resulting in a major loss of export revenues. (6)
January-March 1989	World Bank refused to release a significant potion of the credit it had promised. The price of dollar rose by 45% and triggered a massive withdrawal of dollar deposits from banks.
July 1989	Democratic transfer of power from Alfonsin to Menem.
November 1989	Market opening through the introduction of the New Foreign Investment Regime: - abolition of all legal limits on the type and nature of foreign investments - free foreign exchange regime and fully convertible currency - free repatriation of capital, dividends and capital gains
December 1989	Argentina is listed as a free market for foreign investment by International Finance Corporation
April 1991	By 1991 the economy was experiencing hyperinflation of over 2000%. The Cavallo Plan induced an exchange rate shock. The Ley de Convertibilidad introduced a virtual currency board under which the local currency was pegged to the U.S. dollar and the monetary base was backed by foreign exchange reserves. This combined with strong fiscal adjustment and economic reforms stabilised the economy and resulted in growth (2). The by-product of these reforms was the overvaluation of peso.
October 1991	The Deregulation Decree eliminated the remaining restrictions on foreign investment, including tax on capital gains.
2000	Argentine's debt accounted for 25 percent of all emerging market fixed interest debt.
2001	Financial crisis. Argentina defaulted on all its foreign debt.

Colombia

Time period/Date	State/Event
1980s	Colombia emerged as the only country in Latin America not to have a debt problem. In addition to its oil reserves, Colombia has considerable installed hydroelectric capacity and the opening of the huge coal complex at El Cerrejon in 1984 enables it for the first time to make full use of its reserves, at 3600 million tonnes the largest in Latin America. (3, p.157)
1985	The export of ferronickel was initiated in 1985 from a major ore deposit, Cerro Matoso (8)
1986	Virgilio Barco Vargas from the Liberal party was elected president.
1989	The government withstood a declaration of all-out war by the drug syndicates (3)
1990s	Neoliberal reforms were implemented. With the development of two major petroleum fields in the northern Llanos and in Amazonia the oil production has considerably increased. (8)
December 1991	Resolution 52 allows foreign investors to buy up to 100% of the shares of locally listed companies and abolishes the requirement that investment funds are bound to remain in the country for a at least a year.
1993	Two main drug cartels (Medellin and Cali) were severely undermined by the arrests of key leaders. However, the Revolutionary Armed Forces of Colombia (FARC), and the National Liberation Army (ELN) still remain active. (8)
1994	Liberal Ernesto Samper Pizano was elected president. He made efforts to combat illegal trade of drugs. However he was accused of accepting money from drug syndicates, although he was later cleared.
mid-1900s	Although coffee had declined to about one-eighth of legal exports by the mid-1990s, the country was still second only to Brazil in its production (8).
December 1995	11 member of the Supreme court were killed by guerrillas, involved in illegal trade of cocaine. Colombia is the world's major center for the illegal trade of cocaine (3)
February 2002	The military attacked the rebels positions and forced them into the jungles after the rebels hijacked an airplane and kidnapped a senator.
2003	By the end of 2003 the national debt has risen to 50% of GDP.

Venezuela

Time period/Date	State/Event
1988	Petroleum revenues provided 55% of total revenue. Total government spending reached 23% of GDP. (9)
1988	Venezuela was the only country in Latin America apart from Colombia paying both interest and principal on its external debt, but facing a new balance of payments deficit was unable to get new credit (3).
1989	A debt moratorium was declared. With the support from International Monetary Fund (IMF) and the World Bank some policy reforms were launched. Perez's policies aimed at the reduction of the role of the state in the economy, free market and attraction of foreign capital. The most important achievement of these policies was the devaluation of the Bolivar (8).
February 1989	Price increases (almost by 85%) led to several days of riots leaving hundreds dead.
January 1990	Decree 727 allowed foreign investors to own up to 100% of listed companies except banks.
1990	Despite plentiful natural resources and significant advances in some economic areas, Venezuela still suffered from corruption, and poor economic and political management. (9)
1991	Implementation of radical economic reforms.
1992	Presedent Andres Perez and his orthodox economic reforms were under serious attack from all sectors of society (2). Two attempted military coups, which Perez had survived, but was forced out of office, charged with misappropriating public funds.
January 1994	Foreign investors are allowed to own shares in banks.
June 1994	The exchange rate was fixed and the repatriation of capital and income was prohibited. The banking system was in crises.
June 1995	The trading of Brady bonds was approved by the governments and the currency became fully convertible.
1998	Unexpected appreciation of the Bolivar. In 1998 more than half the population was below the poverty line. The annual inflation exceeded 30 percent and oil prices were in steep decline. Hugo Chavez was elected president.
1999	A new constitution was approved by referendum.
December 1999	The country suffered the deadliest natural cataclysm: mud slides and flash floods took thousands of lives away.
2002 –2003	Hugo Chavez was re-elected, and despite a coup and prolonged protest he survived in the office.

Chile

Time period/Date	State/Event
September 1973-90	After the coup, the military government headed by General Pinochet began to apply the principles of a free market economy. Policies, aimed to encourage private enterprise, strengthened the stock market (11).
1970s	Copper accounted for more than 70% of exports
1982	Banking crisis
1980s	Copper accounted for more than 40% of exports
September 1986	A failed assassination attempt against General Pinochet
1986-88	GDP growth was about 5 per cent annually, inflation remained contained, unemployment dropped to approximately 12 per cent and higher copper prices and good export earnings from non-traditional exports provided a favourable external financial position. (7)
1987	Law 18657 requires capital to be retained for 5 years before it can be repatriated.
1987	40% of the population lived below the poverty line. Average wages were 13 per cent less than in 1981 and still less than in 1970 (7)
1988	The opposition united against Pinochet.
1984-1990	GDP real annual average growth rate – 5.7%, good performance of the Chilean corporations, privatisation of the most important state-owned companies, more intensive use of the stock market to raise equity capital, increasing participation of institutional investors. (11)
1988	The Chilean people voted against the unconditional prolongation of General Pinochet's term. Patricio Aylwin, the Christian Democratic leader, was elected as president. By the time he took the office in March 1990 General Pinochet had already ensured to keep the power. (3)
Since 1989	Fiscal surplus
July 1990	A plebiscite approved major constitutional reforms which reduced the military power in the post-Pinochet system (7)
June 1997	Recession: The price of copper fell from $1.19 a pound in June 1997 to 75 cent in March 1998. 33% of Chile's export went to Asia. (10)
April 1999	The assassination of Senator Jaime Guzman, the leader of the UDI

Thailand

Time period/Date	State/Event
1950s	One of the world's poorest country
1965-1996	The average annual growth rate of the real GDP was over 5%
1986-1996	Real GDP growth of 10.4%
1980s	Gross domestic savings as a percentage of GNP rose from 17 per cent in the early 1980s to over 30 per cent in the late 1980s. (10)
1980-1996	Thailand moved from predominantly agrarian to an industrialised economy. Agriculture's share in GDP fell from 23% to 11%, and manufacturing's share increased from 22% to 28%. (10)
1960s and early 1970s	Strong support of the capital-intensive import-substitution industrialisation (ISI) by the Government's industrial policies.
1987	Commercial banks were the central players in the financial system, absorbing 80.9% of deposits and accounting for 73.1% of total financial system assets, followed by the finance companies, which provided about 20% of all the credit in the country. (10)
1988	A ,foreign board' was created as a parallel stock exchange platform for trading shares by foreign investors. Chatichai Choonhavan became a prime minister.
By 1988	Thailand attracted more FDI than the four Asian newly industrialised countries combined. (10)
1988-1996	The growth rate of export - 14.5%, inflation – 5.3%
Late 1980s	A chief recipient of the Japanese foreign direct investments
1990	Thailand adopted the International Monetary Fund's Article VIII status removing controls on capital account flows. An Import-Export Bank and a Securities and Exchange Commission to regulate the local equities markets. (1)
1991	The military overthrew the Chatichai government accused in corruption. (1)
1992	Demonstrations against the military resulted in bloodshed. The king had to intervene to settle the conflict. (1)
1995	The government approved full foreign ownership of utilities and infrastructure concessions. (1)

Malaysia

Time period/Date	State/Event
1971	UMNO, the Malay party initiate a new economic policy to alleviate poverty among the biggest Malay ethnic group and redistribute income and wealth. The main focus of this policy was to attract direct foreign investment. (1)
1974-1975	Malaysian economy was hit by the world oil crisis and economic recession. FDI fell by 40% from $570 million in 1974 to $350 million in 1975. The exports fell by 10% and the total merchandise trade fell by 9%. The foreign long-term debt increased from $1.1 billion in 1974 to $1.8 billion in 1975. (1)
1975	Industrial Coordination Act (ICA) created a licensing system, which required companies to comply with the NEP guidelines.
December 1975	Foreigners are allowed to own up to 100% of listed companies excluding banks and finance companies
1979-1983	Rapid oil increases resulted in the growth of merchandise export (50% in 1979 alone). Foreign trade became one of the most important sectors of the economy and total merchandise trade was accounting for more than 80% of GDP during this period. The high volume of petrodollars allowed the government to start implementing import-substitution capital-incentive industrialisation. (1)
1984-86	The Malaysian economy is adversely affected by the world commodity shock. GDP fell for the first time in a decade.
mid-1980s	The depreciation of the U.S. dollar to yen increased significantly the burden of foreign debt as it was denominated primarily in the Japanese yen.
1986-87	A sharp increase in the long-term direct investment
1986-89	The Malaysian government reduced its direct involvement in business sector.
Early 1990s	The appreciation of yen encouraged deeper integration of the Japanese and other Asian Pacific economies with reallocation of the main operations of the Japanese companies to the neighbouring countries. This contributed to a rapid growth of real GDP in Malaysia over the following eight years averaging 8% annually. The exports of goods and services grew at 17% annually between 1990 and 1993. (1)

Indonesia

Time period/Date	State/Event
1965-1998	The rule of Suharto New Order Government. The Suharto regime eliminated the fiscal deficit through drastic expenditure cuts and passed a "balanced budget" law in 1967 prohibiting domestic financing of the budget in the form of either debt or money creation. Effective macroeconomic management helped Indonesia steer through the difficulties of the steep oil price increases and declines in the 1970s and 1980s, and kept the macro-economy largely in balance right up to the onset of the crisis in mid-1997. (10)
1970 – 1989	Economic growth averaged 7%
1979-1985	Growth in rice production, total output increased by 49%.
1980s	Since mid-1980s, inflation has been kept within single digits and on the eve of the crisis was about 6% (10)
1983-1995	Manufacturing contributed roughly one-third of the increase in GDP. It was comprised not only of oil and natural gas processing industries, but a diverse range of manufacturing industries. (10)
1983	Devaluation of the rupiah
Late 1980s	The economy had become more trade-dependant, with total trade flows as a percentage of GDP rising sharply from 14% in 1965 to 54.7% in 1990.
Since mid-1980s	Single-digit inflation rates
September 1989	The Ministry of Finance allowed foreigners to purchase up to 49% of all companies' listed shares excluding bank shares
1986-1997	Gradual relaxation of the exchange-rate policy by widening the intervention band and allowing it to float within the band until the rate was freed in August 1997
1990	National savings as a percentage of GDP increased from 7.9% in 1965 to 26.3% in 1990 (10)
1990s	Average current account deficit was only 2.6% of GDP.
October 1992	Foreigners are allowed to invest up to 49% of listed shares of private national banks.
1990-1996	Economic growth averaged 8%. Per capita income rose from US$75 in 1966 to US$1,200 in 1996. Agriculture's share of GDP declined from 55% in 1965 to 19.4% in 1990, while industrial output expanded from 13% to 42% - with a corresponding rise in the share of manufactures in GDP from 8% to 20% by 1990. (10)
1993	Manufactured exports reached US$12 billion and accounted for 53% of total exports. (10)
1996	Current account deficit was 3.5%
1997	Financial crisis. Devaluation of the rupiah.

The Philippines

Time period/Date	State/Event
1965	President Ferdinand Marcos came to power. After the late 1950s the economic performance of the Philippines was gradually weakening, while the Philippines enjoyed the highest economic growth in Asia Pacific throughout the 1950s. The main obstacle of the economic development was the Philippines elite. Also the openness to trade of the Philippines was much less in comparison to other Southeast Asian countries. (1)
Early 1980s	The government failed to achieve a significant level of revenues from the Philippine elite to finance the economic development policies. The foreign debt position was hit by the strong U.S. dollar.
mid-1980s	The collapse of the Philippine economy. GDP fell by 7 percent. Unemployment and underemployment reached 40 percent. Between 1982 and 1986 the real income per capita fell by 16 percent. (10)
1980s	The volume of foreign debt was rapidly increasing. Banks defaulted to the Development Bank of the Philippines and the Philippine National Bank. The government took over the leading role in the financial and agricultural sectors through monopolisation and privatisation of certain industries. (1)
April 1985	The IMF refused the second tranche of a loan. The country was experiencing high inflationary pressure by late 1985. (10)
1985	Foreign investors are allowed to own up to 40% of local firms.
March 1986	The ouster of Ferdinand Marcos from office and the restoration of democracy.
1987-92	Net capital inflows fell sharply in 1987, but recovered considerably by 1990 totalling $1.7 billion and over $2.5 billion by 1992. Net direct investment increased six times from 1987 to 1989 with capital flowing from Northeast Asia.(1)
1990-92	The Persian Gulf War adversely affected the Philippine economy with the tourism sector hit the most. It also led to the loss of overseas remittances, which were at around $2.9 billion in 1990. The loss of a $480 million a year leasing contract with the United States over the Clark and Subic Bay bases. These loses were partly offset by a surge in recruitment of Filipino workers in Taiwan. (1)
1992	The election of Fidel V. Ramos. His government contributed to the stabilisation of the economy, elimination of state monopolies in agriculture and restructuring of the financial sector. (1)
1993	Economic recovery.
May 1995	Several representatives of the managerial class won the seats in the Senate, dominated by the rural oligarchs.
1995	The Philippines became a member of the ASEAN Free Trade Area.

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APPENDIX II

Table 1. The analysis of the studies on the determinants of stock market performance in emerging economies.

Date	Author(s)	Data sources	Data	Main determinants	Variables	Model	Time span	Sample	Results
2003	Gendreau B Heckman L	Citigroup Global Markets' Emerging Market and Yankee bond desks S&P's Bond Guides MSCI[1] Emerging Market Free total return indexes	A data set of monthly observations on sovereign yield spreads from December 2001 consisting primarily of spreads on U.S. dollar-denominated Brady bonds and uncollateralized Eurobonds, Yankee bonds, and global bonds.	Sovereign yield spreads	Control variables: - Book-to-price ratio (B/P) - trailing earnings yield (E/P), which is inverse of the trailing P/E ratio - De-trended short-term real rate of interest (ΔReal Rate) - Institutional Investor's country credit ratings (CCR)	A series of backtests with hypothetical portfolios of emerging market equities	1992-2001	The sample begins with spreads from only 5 countries, but grows to 15 countries by August 1996, and to 21 countries by May 1999. Countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela, China, India, Indonesia, Malaysia, Philippines, South Korea, Thailand, Egypt, Greece, Hungary, Israel, Poland, Russia, South Africa, Turkey.	The sovereign yield spreads convey information that could be used to outperform a passive benchmark.
2002	Kaminsky G Schmukler S	EMBI, Bloomberg, Datastream	EMBI, EMBI+	Country ratings, sovereign yield spreads	Sovereign bond yield spreads, country ratings from Moody's, S&P, Fitch	Panel regressions	January 1990-June 2000	16 countries: Argentina, Brazil, Chile, Colombia, Indonesia, Malaysia, Mexico, Peru, the Philippines, Poland, the Republic of Korea, the Russian Federation, Taiwan, Thailand, Turkey, and Venezuela.	The credit ratings directly impact the markets of the countries rated. Upgrades tend to take place during market rallies, whereas downgrades occur during downturns giving the evidence that credit ratings contribute to the instability in emerging markets.
1996	Erb CB	ICRG[2], IICCR[3]	Country ratings	Country ratings	International Country		January 1984	117 countries	The country-risk measures

[1] Morgan Stanley Capital International
[2] International Country Risk Guide

	Harvey CR Viskanta TE				Risk Guide's political-, financial-, economic-, and composite-risk indexes		– July 1995		are correlated with future equity returns and also highly correlated with equity valuation measures.
1996	Erb CB Harvey CR Viskanta TE	MSCI, IFC[4], IICCR	Emerging Market indices, Country ratings	Country ratings		Regression analysis	September 1979 – March 1995	47 countries	The paper suggests that the reward for the country risk is similar across emerging and developed countries.
1997	Bekaert et al	IFC, MSCI, BEMI[5]; IICCR, ICRG, EMCCR[6]	Emerging Market indices, Country ratings	Country ratings	Control variables: - inflation rates; population growth, average age, average age growth; - the ratio of market capitalisation to the previous year's GDP; - size - valuation ratios (price-to-book value, price-to-earnings, price-to-dividend)	Regression analysis	March 1996	Argentina, Brazil, Chile, China, Colombia, Czech Rep., Greece, Hungary, India, Indonesia, Jordan, Malaysia, Mexico, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, South Africa, South Korea, Sri Lanka, Taiwan, Thailand, Turkey, Venezuela, Zimbabwe	Country risk, trade-to-GDP, earnings-to-price ratios are useful in identifying high- and low-expected return environments
1996	Chan Y Wei K	Hang Seng Index, Red-Chip Index, South China Morning Post	Daily returns, daily political news	Political news		GARCH-M, non-parametric tests	January 1, 1990 – May 31, 1993	Hong-Kong	The favourable (unfavourable) political news is correlated to positive (negative) returns for the Hang Seng Index
1995	Cosset J Suret J	IFC FT-Actuaries World Indices	Monthly stock market indices Ft-Actuaries World Indices and the	Political risk		A quadratic programming technique	April 1982 – December 1991	36 countries	The inclusion of politically risky countries in international portfolios

[3] Institutional Investor's country credit ratings
[4] International Country Risk Guide
[5] ING Barings' Emerging Markets Indices
[6] Euromoney's Country Credit Risk

		are jointly prepared by the Financial Times, Goldman Sachs & Co, and County NatWest/Wood Mackenzie & Co.	IFC Indices						improves their risk-return characteristics.
1996	Diamonte RL Liew JM Stevens RL	International Country Risk Guide (ICRG)	Monthly measure of political risk, monthly total returns (inclusive of dividends) in U.S. dollars on stock indexes from MSCI and IFC	Political risk		Average risk, average quarterly risk change, standard deviation of	January 1985 – June 1995	46 developed and developing countries	Average returns in emerging markets experiencing decreased political risk exceed those of emerging markets experiencing increased political risk by approximately 11 percent a quarter.
1995	Bailey W Chung YP	Interacciones Casa da Bolsa S.A. de C.V., a member of the Mexican stock exchange	Daily closing stock prices (a sample of 44 of the more liquid equities)	Exchange rate	Control variables: the economic shocks, free risk interest rate, the monthly return rate between a dollar bond issued by the Mexican government, the expected cost of Mexican sovereign default risk, the monthly log-change in the IPC stock index in excess of the riskless CETES yield and others.	Regression analysis	January 1986-June 1994	Mexico	There are premiums for currency and political risk.
1995	Harvey C	Emerging Market Data Base of the IFC	Monthly value-weighted index returns (more than 800 equities)	Exchange rate	Control variables: currency risk, CRB food price index and other local risk factors	Frontier intersection test	1976-1992	Argentina, Brazil, Chile, Colombia, Mexico, Venezuela, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Taiwan,	The predictability in the emerging markets is greater than in developed markets and over the half of the predictable variance is attributed to local risk

								Thailand, Greece, Portugal, Turkey, Jordan, Nigeria, Zimbabwe	factors.
1995	Erb C Harvey C Viskanta T	MSCI, IFC, International Financial Statistics data base of the IMF[7]	21 country total return indices from MSCI and 20 total return indices from IFC	Inflation	Control variables: interest rates, local inflation, volatility	Regression analysis	The sample ends in December 1993, the start date for each country depends on the availability of the inflation and equity data	41 developed and equity markets	Inflation reveals information about risk exposure and equity volatility is positively linked to average inflation rates.
1994	Ferson W Harvey C	MSCI	Monthly data	Global economic risks	Returns on a world equity market portfolio, exchange risk, a Eurodollar-U.S. Treasury bill yield spread, global inflation, real interest rates, industrial production growth	Factor model regressions	1970-1989	Sixteen OECD countries, Singapore/Malaysia, Hong Kong	The find significant premiums associated with the world equity index and exchange rate.
2006	Abugri B	MSCI	Monthly returns	Macroeconomic variables	Exchange rate, interest rate, industrial production, money supply	Vector autoregressive (VAR) model	January 1986 to August 2001	Argentina, Brazil, Chile and Mexico	The empirical results show that the global factors consistently and significantly impact four Latin American markets, while the local variables are transmitted to the markets at varying magnitudes and significance.

[7] International Monetary Fund

2004	Hooker M	MSCI Emerging Markets free index	Monthly data	Macroeconomic variables, valuation ratios	- the change in the foreign currency exchange rate vs. the US dollar (lagged) - a local interest rate (an interbank rate with a maturity of 1-3 months, lagged). - real short-term rate (short term rate less lagged inflation) relative to its average value over the past 36 months - change in expected GDP growth - inflation - EMBI spreads - beta - price momentum, P/E, P/B, downside risk, size (market index weight)	The Bayesian model selection approach	January 1992 – December 2002	13 countries at the beginning of 1992 and 26 by 2002.	Most of the macroeconomic variables turned to be not significant.
1999	Kassimatis K Spyrou S	IMF International Financial Statistics database and Datastream	Also a measure of stock market volatility, which is the 12-month rolling standard deviation of the first difference of the log of the International Finance corporation (IFC) Price Indices	Monetary variables	the logarithm of industrial production as a proxy for economic development, the log of market capitalisation as a proxy for stock market development and log of bank credit of private and public banks to the private sector and money supply as a proxy for banking development		January 1977 – October 1997, except for Chile and South Korea where it begins January 1977 and ends January 1996.	India, South Korea, Chile, Mexico, Taiwan	The phenomenal development of stock markets in developing countries was backed up by good prospects of economical growth.

2001	Muradoglu G Metin K Argac R	ISE Composite Index	Daily stock prices	Monetary variables	overnight interest rates, money supply, foreign exchange rates	Cointegration tests	January 1988 to April 1995	Turkey	No cointegrating relationship between stock prices and any of monetary variables under consideration
2004	Maroney N Naka A Wansi T	S&P' s Emerging Markets database (EMDB); MSCI	Weekly data on national equity market total returns, exchange rates, P/B and price-to-earnings (P/E) ratios of each country together with 48 emerging market country averages of these variables	Valuation ratios	P/B and price-to-earnings (P/E) ratios Control variables: US Dollar returns, local returns, exchange rate changes	Capital asset pricing model	401 weekly observations from October 5, 1990 to June 5, 1998	Indonesia, South Korea, Malaysia, the Philippines, Taiwan and Thailand	Leverage ratios play a role in explaining the volatility of stock market returns.
1994	Claessens S Rhee M	IFC EMBD, IFC investibility index	Stock prices and rates of return	Valuation ratios	P/E ratio, Investibility index	CAMP	1989-1992	Indonesia, Korea, Malaysia, Pakistan, Philippines, Taiwan, Thailand, Greece, Jordan, Brazil, Chile, Colombia, Mexico, Venezuela, Nigeria, Zimbabwe	
1998	Claessens S Dasgupta S Glen J	IFC	Asset prices, dividends, exchange rates, trading volume and accounting ratios	Valuation ratios	Beta, size, trading volume, dividend yield, earnings/price ratios, exchange rate risk	Capital asset pricing model	1986-1993	Brazil, Chile, Colombia, Greece, India, Jordan, Korea, Malaysia, Mexico, Nigeria, Philippines, Portugal, Taiwan, Thailand, Turkey, Zimbabwe	Size and trading volume have significant explanatory power in a number of the sample countries. Dividend yield and earnings/price ratios are also important but in fewer markets. Exchange rate has significant explanatory power in several countries.
2002	Groot C Vershoor W	Datastream	Monthly data on Asian stock markets	Valuation ratios	market-to-book ratio, size	Capital asset pricing model	January 1984-January 2000	India, Korea, Malaysia, Taiwan, Thailand	A strong size effect in all markets and a significant market-to-book effect in Korea, Malaysia and Thailand.

1998	Rouwenhorst G	EMDB of IFC	Monthly data	Valuation ratios	size, book-to-market ration, earnings-to-price, momentum	CAMP	From 1975-1997	1700 firms from 20 emerging countries (Argentina, Brazil, Chile, Colombia, Greece, Indonesia, India, Jordan, Korea, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Portugal, Taiwan, Thailand, Turkey, Venezuela, Zimbabwe)	Small stocks outperform large stocks, value stocks outperform growth stocks and emerging markets stocks exhibit momentum.
1994	Ferson W Harvey C	MSCI	National equity market returns, country attributes,	Valuation ratios	Price-to-book-value, cash-flow, earnings, dividends, economic performance indicators (GDP, inflation), industry structure	CAMP	01/1975-05/1993	OECD countries	They find that average returns in 21 developed countries are related to the volatility of their price-to-book ratios and predictable variation in returns is also related to relative GDP and, interest rate levels, and dividend-price ratios.
1998	Patel S	IFC emerging markets database, The monthly IFC publications titled "Constituents of the IFC Indexes"	Monthly observations	Valuation ratios	Price-to-book value, price-to-earnings and size	Portfolio-based approach	January 1988 – March 1997	21 countries: Argentina, Brazil, Chile, Greece, India, Korea, Malaysia, Mexico, Portugal, Taiwan, Thailand, China, Colombia, Indonesia, Jordan, Nigeria, Pakistan, Peru, Philippines, Sri Lanka, Turkey, Zimbabwe	The portfolios based on the lower sector-relative values of price-to-book value, price-to-earnings, and size proved to provide statistically significant returns over the IFC Global Index.
2000	Harvey C	MSCI	Monthly observations	Valuation ratios	Size, downsize beta, spreads, political and country risk	Regression analysis	January 1988 to December 1999	47 countries	There is no relationship between international returns and size.

1998	Chui A Wei J	PACAP databases	Monthly observations	Valuation ratios	Book-to-market equity, size, market beta	Portfolio-based approach	December 1984-December 1993	Hong Kong, Korea, Malaysia, Taiwan, and Thailand	In all markets the relationship between average stock returns and market beta is weak. The book-to-market equity has explanatory power in Hong Kong, Korea and Malaysia, while the size is significant in all markets except Taiwan.
1997	Tandon K	IFC's EMDB[8], Euromoney Bondware, World Bank	Weekly data on Eurobond and country fund offerings, weekly stock prices	Market liberalisation	Announcement of a launch of country funds and issue of Eurobonds	Standard event methodology	1990-1992	Argentina, Brazil, Indonesia, Korea, Mexico, Portugal, Taiwan, Thailand, Venezuela	The launch of country funds and issue of Eurobonds lead to positive abnormal returns around these events.
2000	Bekaert G Harvey C	The US Treasury Bulletin, IFC, IICCR,	IFC global indices, country ratings, FX rates,	Country-specific liberalisation variable	Control variables: - dividend yield, - fitted volatility - market capitalisation to GDP - Inflation rate - Number of companies in index - Concentration ratio - FX volatility - Exports+imports to GDP - Country credit ratings	Regression analysis	January 1976 – December 1995	Argentina, Brazil, Chile, China, Colombia, Greece, India, Indonesia, Jordan, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Portugal, South Korea, Taiwan, Thailand, Turkey, Venezuela, Zimbabwe	A small but mostly insignificant increase in the volatility after the market liberalisation. Most of the control variables proved to be not significant.
2000	Henry P	IFC's Emerging Markets Data Base, IFC Total Return Index (U.S. dollar denominated).		Market liberalisation	macroeconomic stabilisation programmes, trade liberalisation, privatisation, the easing of the exchange controls	CAMP		Argentina, Brazil, Chile, Colombia, Mexico, Venezuela, India, Malaysia, Korea, the Philippines, Taiwan, and Thailand	On average, a county's aggregate equity price index experiences abnormal returns of 3.3 percent per month prior to its initial stock liberalisation.

[8] International Finance Corporation's Emerging Markets Database

2000	Basu P Kawakatsu H Morey M	Emerging market Database at the IFC International Financial Statistics	Monthly total return global stock price indexes	Market liberalisation	log first difference of the real stock prices	Return autocorrelation test using Ljung-Box Q-statistics and the variance ratio test for the random walk hypothesis	For some countries data beginning in January 1976 and ending in august 1999	Argentina, Brazil, Chile, Colombia, Czech Republic, Greece, Hungary, India, Indonesia, Jordan, Korea, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Portugal, South Africa, Sri Lanka, Taiwan, Thailand, Turkey, Venezuela	Only weak support for less predictability after liberalisation
2002	Hargis K	IFC	Weekly and monthly stock market index data , dollar total return indexes	Market liberalisation	Return on the world market portfolio; An indicator function measuring the percentage of the local market owned by foreign investors, number of ADRs, and number of closed-end funds listed in the United States.		January 1989 – November 1994	Argentina, Brazil, Chile, Mexico, Korea, Malaysia, Taiwan, Thailand	A limited number of companies and market participants reduce the risk sharing opportunities and liquidity of the stock market.
1997	Hargis K Maloney W	IFC Total Return Indices International Financial Statistics	Return data ate the value-weighted portfolio of NYSE and AMEX stocks including dividends from the Center for Research in Security Prices. For Japan, the data are the Nikkei index including dividends.	Industrial production	Control variables: Global information variables from the US and Japan (dividend yields, term spread, and default spread)	Regression analysis	December 1975 – December 1993	Countries: Mexico, Brazil, Argentina, Taiwan, Korea and Malaysia	The markets in Chile, Mexico and Malaysia appear more rational than in Taiwan and Korea

APPENDIX III

The calculation of the market value of an economy

The market value of an economy is calculated according to Clark (1991a,b, c). The methodology is described below and based on the following notations[18]:

X = total exports not including investment income measured in USD

M = total imports not including investment income measured in USD

M^C = imports of final consumption goods measured in USD

C = local consumption measured in USD

b[19] = total income from the sale of the economy's output of final goods and services measured in USD

t = time

$b_t = X_t + C_t - M_t^C$

a[20] = total expenditure by the economy for the purchase of final goods and services measured in USD

$a_t = M_t + C_t - M_t^C$

$R = 1 + r$ Where r represents the economy's internal rate of return

S = spot exchange rate expressed as the price of 1 USD in local currency

$F_{t,T}$ = the forward exchange rate at time t for delivery at time T

V_t = the value of the economy at the beginning of period t measured in USD

α = the percent of imports in GDP

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[18] Subscripts denote the time period and asterisks refer to local currency.

[19] According to the definition of b and a it follows that $b - a = X - M$ and exports and imports are given to reflect international prices.

[20] According to the definition of b and a it follows that $b - a = X - M$ and exports and imports are given to reflect international prices.

Following the definitions, listed above, the value of the economy in USD can be written as the present value of expected macroeconomic cash flows:

$$V_t = E\left[b_t - a_t + (b_{t+1} - a_{t+1})R^{-1} + \ldots + (b_n - a_n)R^{-(n-t)}\right] \qquad (6)$$

where all transactions take place on the first day of each period. Similarly, the value of the economy in local currency is

$$V_t^* = E\left[b_t^* - a_t^* + (b_{t+1}^* - a_{t+1}^*)R^{*-1} + \ldots + (b_n^* - a_n^*)R^{*-(n-t)}\right] \qquad (7)$$

where the asterisks denote local currency. Substituting the equivalent formulas for the date $t+1$ into equations 6 and 7 gives

$$V_t = b_t - a_t + V_{t+1}R^{-1} \qquad (8)$$

and

$$V_t^* = b_t^* - a_t^* + V_{t+1}^* R^{*-1} \qquad (9)$$

Taking into consideration that by definition $b - a = X - M$, and $X_t^* = S_t X_t$ and $M_t^* = S_t M_t$, one can make these substitutions into equation 7, pass the expectations operator through the equation and apply forward rate parity $E(S_T) = F_{t,T}$ and interest rate parity $F_{t,T} = S_t \frac{R^{*T}}{R^T}$. This gives[21]

$$V_t = \frac{V_t^*}{S_t} \qquad (10)$$

The corresponding formula for $t+1$ is

[21] The same steps can be applied to calculate $V_{t+1} = \frac{V_{t+1}^*}{S_{t+1}}$ and $V_{t+1} = \sum_{T=0}^{t} V_{T+1} - V_T$.

$$V_{t+1} = \frac{V_{t+1}^*}{S_{t+1}} \qquad (11)$$

Clark (1991a,b, c) uses *ex post* data on investments (the accounting or historical value of the economy) in local currency compounded at the economy's internal rate of return. This is done in order to relate the *ex post* data to the present expected values reflected in equation 9 and thus, the retrospective value of the economy's net export capacity should be as follows (the sign is changed as it is the retrospective value of the economy):

$$V_t^* = -(b_0^* - a_0^*)R^{*t-1} - (b_1^* - a_1^*)R^{*t-2} - \ldots - (b_{t-1}^* - a_{t-1}^*)R^* \qquad (12)$$

As the export and imports are given to reflect international prices, the macroeconomic market value of the economy will also reflect international prices.

Substituting the value of V_{t+1}^* into equation 12 and rearranging gives equation 9. Equations 9 and 12 are equivalent if the *ex post* and the *ex ante* internal rates of return are the same.[22]

Clark (1991a,b, c) makes the assumption that the *ex post* and the *ex ante* internal rates of return are the same and use the retrospective values to estimate the expected future values. In order to do this, he multiplies equation 9 by $1 + r^*$ and rearranges to get the expression for net domestic product at the end of the period. For simplification reason he ignores ignore interest on net exports which disappear in continuous time [23]

$$X_t^* - M_t^* + C_t^* + (V_{t+1}^* - V_t^*) = r^* V_t^* + C_t^* \qquad (13)$$

[22] For a proof of this see John Hicks, *Capital and Time: A Neo-Austrian Theory*, (Oxford: Clarendon Press, 1987).
[23] See Clark, (1991a, p. 43).

The left-hand side of equation 13 is the net domestic product with net investment in any year equal to $V_{t+1} - V_t$. In year t $V_{T+1}* - V_T*$ will be annual net investment (gross fixed capital formation plus change in inventories less depreciation) and the economy's market value in local currency can be calculated as follows:

$$V_t* = \sum_{T=0}^{t-1} V_{T+1}* - V_T* \qquad (14)$$

Thus, the calculation of the economy's market value will involve calculation of the accumulated net capital formation (NFC) in local currency from years 0 to t-1 and adding them up. The value in USD can be found using equation 10. Clark (2002) warns of the complication, which should be taken into account, is the capital value outstanding at the end of the year before the first year of the sample. Thus, C_t* should subtracted from the both sides of equation 13. With all values converted in USD, to calculate profits generated with the capital outstanding at the year-end before the first year of the sample, the following regression is used:

$$X_t - M_t + (V_{t+1} - V_t) = c + \hat{r}V_t + u_t \qquad (15)$$

where c is a constant representing profits generated with the capital outstanding at the end of the period preceding the first year of the sample period, $\hat{r}$ represents the estimated return for the sample period and u_t is a random error. Clark (2002) recommends to use 18 years in the regression analysis as this period will capture two trade cycles. The constant c from the equation 15 can be capitalised, i.e. $c/\hat{r}$, in order to calculate the market value of the country's economy in the year before the first year of the sample. As this value is in USD, it should be converted back into local currency.

APPENDIX IV

Quarterly correlations of the variables

Table 1. Correlation matrix for Argentina

	FRP	FX	INF	MINT	II	DY	USR
FRP	1	-.205	.505(**)	-.228(*)	-.773(**)	-.558(**)	.611(**)
FX	-.205	1	-.343(**)	.878(**)	-.023	.152	-.758(**)
INF	.505(**)	-.343(**)	1	-.195	-.412(**)	.005	.472(**)
MINT	-.228(*)	.878(**)	-.195	1	.001	.197	-.669(**)
II	-.773(**)	-.023	-.412(**)	.001	1	.598(**)	-.380(**)
DY	-.558(**)	.152	.005	.197	.598(**)	1	-.371(**)
USIR	.611(**)	-.758(**)	.472(**)	-.669(**)	-.380(**)	-.371(**)	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 2. Correlation matrix for Brazil

	FRP	FX	INF	MINT	II	DY	USIR
FRP	1	-.755(**)	-.807(**)	-.680(**)	-.782(**)	-.263(*)	.486(**)
FX	-.755(**)	1	.977(**)	.872(**)	.782(**)	.124	-.794(**)
INF	-.807(**)	.977(**)	1	.858(**)	.832(**)	.134	-.804(**)
MINT	-.680(**)	.872(**)	.858(**)	1	.602(**)	.068	-.680(**)
II	-.782(**)	.782(**)	.832(**)	.602(**)	1	.135	-.615(**)
DY	-.263(*)	.124	.134	.068	.135	1	-.001
USIR	.486(**)	-.794(**)	-.804(**)	-.680(**)	-.615(**)	-.001	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 3. Correlation matrix for Chile

	FRP	FX	INF	MINT	II	DY	USIR
FRP	1	-.881(**)	.875(**)	-.318(**)	-.954(**)	.515(**)	.827(**)
FX	-.881(**)	1	-.848(**)	.370(**)	.898(**)	-.428(**)	-.888(**)
INF	.875(**)	-.848(**)	1	-.139	-.903(**)	.506(**)	.869(**)
MINT	-.318(**)	.370(**)	-.139	1	.148	.266(*)	-.223
II	-.954(**)	.898(**)	-.903(**)	.148	1	-.597(**)	-.864(**)
DY	.515(**)	-.428(**)	.506(**)	.266(*)	-.597(**)	1	.487(**)
USIR	.827(**)	-.888(**)	.869(**)	-.223	-.864(**)	.487(**)	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 4. Correlation matrix for Colombia

	FRP	FX	INF	MINT	II	DY	USIR
FRP	1	-.797(**)	.755(**)	-.818(**)	-.637(**)	.330(**)	.734(**)
FX	-.797(**)	1	-.889(**)	.967(**)	.225	-.129	-.857(**)
INF	.755(**)	-.889(**)	1	-.903(**)	-.347(**)	-.082	.750(**)
MINT	-.818(**)	.967(**)	-.903(**)	1	.216	-.058	-.811(**)
II	-.637(**)	.225	-.347(**)	.216	1	-.385(**)	-.326(**)
DY	.330(**)	-.129	-.082	-.058	-.385(**)	1	.264(*)
USIR	.734(**)	-.857(**)	.750(**)	-.811(**)	-.326(**)	.264(*)	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 5. Correlation matrix for Mexico

	FRP	FX	INF	MINT	II	DY	USIR
FRP	1	-.801(**)	.689(**)	-.601(**)	-.891(**)	.334(**)	.770(**)
FX	-.801(**)	1	-.591(**)	.943(**)	.793(**)	-.515(**)	-.842(**)
INF	.689(**)	-.591(**)	1	-.494(**)	-.688(**)	.438(**)	.587(**)
MINT	-.601(**)	.943(**)	-.494(**)	1	.619(**)	-.532(**)	-.733(**)
II	-.891(**)	.793(**)	-.688(**)	.619(**)	1	-.304(**)	-.800(**)
DY	.334(**)	-.515(**)	.438(**)	-.532(**)	-.304(**)	1	.496(**)
USIR	.770(**)	-.842(**)	.587(**)	-.733(**)	-.800(**)	.496(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

Table 6. Correlation matrix for Venezuela

	FRP	FX	INF	MINT	II	DY	USIR
FRP	1	.050	.816(**)	.647(**)	-.386(**)	-.172	-.259(*)
FX	.050	1	-.168	-.159	-.540(**)	.864(**)	-.787(**)
INF	.816(**)	-.168	1	.638(**)	-.377(**)	-.288(*)	.039
MINT	.647(**)	-.159	.638(**)	1	-.302(**)	-.225	.076
II	-.386(**)	-.540(**)	-.377(**)	-.302(**)	1	-.417(**)	.294(**)
DY	-.172	.864(**)	-.288(*)	-.225	-.417(**)	1	-.686(**)
USIR	-.259(*)	-.787(**)	.039	.076	.294(**)	-.686(**)	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 7. Correlation matrix for Indonesia

	FRP	FX	INF	MINT	II	DY	USIR
FRP	1	-.272(*)	.321(**)	-.044	.419(**)	-.308(*)	.544(**)
FX	-.272(*)	1	.496(**)	.788(**)	-.766(**)	.562(**)	-.739(**)
INF	.321(**)	.496(**)	1	.803(**)	-.028	.093	-.316(**)
MINT	-.044	.788(**)	.803(**)	1	-.343(**)	.218	-.585(**)
II	.419(**)	-.766(**)	-.028	-.343(**)	1	-.472(**)	.553(**)
DY	-.308(*)	.562(**)	.093	.218	-.472(**)	1	-.738(**)
USIR	.544(**)	-.739(**)	-.316(**)	-.585(**)	.553(**)	-.738(**)	1

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 8. Correlation matrix for Malaysia

	FRP	FX	INF	MINT	II	DY	USIR
FRP	1	-.406(**)	-.561(**)	-.784(**)	-.108	-.084	.546(**)
FX	-.406(**)	1	-.087	.771(**)	-.450(**)	.553(**)	-.708(**)
INF	-.561(**)	-.087	1	.259(*)	.320(**)	-.031	-.169
MINT	-.784(**)	.771(**)	.259(*)	1	-.091	.245(*)	-.826(**)
II	-.108	-.450(**)	.320(**)	-.091	1	-.250(*)	.052
DY	-.084	.553(**)	-.031	.245(*)	-.250(*)	1	-.441(**)
USIR	.546(**)	-.708(**)	-.169	-.826(**)	.052	-.441(**)	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 9. Correlation matrix for the Philippines

	FRP	FX	INF	MINT	II	DY	USIR
FRP	1	-.782(**)	.452(**)	-.781(**)	-.925(**)	.525(**)	.824(**)
FX	-.782(**)	1	-.406(**)	.950(**)	.853(**)	-.177	-.830(**)
INF	.452(**)	-.406(**)	1	-.453(**)	-.423(**)	-.228	.623(**)
MINT	-.781(**)	.950(**)	-.453(**)	1	.799(**)	-.138	-.782(**)
II	-.925(**)	.853(**)	-.423(**)	.799(**)	1	-.406(**)	-.803(**)
DY	.525(**)	-.177	-.228	-.138	-.406(**)	1	.287(*)
USIR	.824(**)	-.830(**)	.623(**)	-.782(**)	-.803(**)	.287(*)	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 10. Correlation matrix for Thailand

	FRP	FX	INF	MINT	II	DY	USIR
FRP	1	-.379(**)	-.004	-.721(**)	-.021	.677(**)	.657(**)
FX	-.379(**)	1	-.432(**)	.825(**)	-.661(**)	-.310(**)	-.694(**)
INF	-.004	-.432(**)	1	-.246(*)	.715(**)	.046	.205
MINT	-.721(**)	.825(**)	-.246(*)	1	-.339(**)	-.651(**)	-.837(**)
II	-.021	-.661(**)	.715(**)	-.339(**)	1	-.008	.235(*)
DY	.677(**)	-.310(**)	.046	-.651(**)	-.008	1	.515(**)
USIR	.657(**)	-.694(**)	.205	-.837(**)	.235(*)	.515(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

APPENDIX V

The results of the regression analysis (annual data)

Table 1. Augmented Dickey-Fuller (ADF) unit root test results

	Argentina	Brazil	Chile	Colombia	Mexico	Venezuela	Malaysia	Philippines	Thailand	Indonesia
TR[24]	-5.095***	-5.698***	-2.985**	-3.346**	-4.45***	-4.119***	-4.57***	-3.481***	-3.61***	-4.994***
FRP	-1.731	-1.026	-0.193	-0.437	0.339	-2.968**	-2.305	-0.783	-1.494	-1.244
ΔFRP	-4.614***	-2.794*	-2.967**	-3.811***	-3.74***		-11.9***	-6.460***	-5.652***	-4.914***
FX	-0.650	0.167	-1.023	1.286	-0.428	2.391	-1.745	0.223	-1.514	-0.465
ΔFX	-4.862***	-4.436***	-2.513	-4.101***	-3.56***	-3.005**	-4.21***	-4.928***	-5.831***	-3.686***
Δ2FX			-2.933**							
INF	-2.328	n/a	-1.912	-0.191	-1.541	-2.543	-2.171	-4.856***	-2.246	-3.629***
ΔINF	-3.796***	n/a	-4.224***	-4.272***	-3.64***	-5.131***	-5.06***		-5.349***	
MINT	-0.201	-0.008	-1.820	-1.312	-1.516	-2.107	-1.460	-1.091	-0.632	-2.514
ΔMINT	-4.800***	-4.676***	-3.506***	-5.139***	-3.147**	-4.565***	-3.35***	-3.350**	-4.864***	-6.599***
II	-0.955	-1.200	-1.808	-1.042	-0.022	-1.996	-1.790	-1.215	-1.443	-0.429
ΔII	-2.397	-3.661***	-3.456**	-2.901**	-3.91***	-3.929***	-3.65***	-3.565***	-3.325**	-3.097**
Δ2II	-2.974**									
USIR	-1.865	-1.865	-1.865	-1.865	-1.865	-1.865	-1.865	-1.865	-1.865	-1.865
ΔUSIR	-7.185***	-7.185***	-7.185***	-7.185***	-7.185***	-7.185***	-7.185***	-7.185***	-7.185***	-7.185***
GDP	-3.355**	-3.449***	-2.650*	-3.110**	-3.99***	-3.383**	-3.286**	-5.330***	-2.072	-2.763**
ΔGDP									-4.116***	
QR	-2.469	0.106	-2.157	-2.318	2.192	-5.379*	-2.125	-0.804	1.570	-0.251
ΔQR	-4.247***	-2.250	-5.716***	-3.016**	-2.573*		-3.127**	-4.086***	-2.037	-4.172***
QR_2		-4.627***							-7.551***	

[24] TR (Total returns), FRP (Financial risk premium), FX (Foreign exchange rate), INF (Inflation), MINT (Market integration), II (Institutional Investor ratings), DY (Dividend yield), USIR (U.S. interest rates), QR (quick ratio).

Table 2. Regression results for Argentina

Dependent variable is TR		
17 obs from 1987 to 2003		
Regressor	Coefficient	T-Ratio[Prob]
C	-.35690	-.87252[.408]
ΔFRP	-9.7735*	-1.8075[.100]
ΔFX	3.5813*	2.1342[.065]
ΔINF	.0019581**	2.4268[.041]
ΔMINT	-24.9324	-1.5340[.164]
Δ2II	-.029831	-.53946[.604]
ΔUSIR	-2.7647	-.063408[.951]
GDP	0.19999*	2.1477[.064]
ΔQR	-.75839	-.93470[.377]
R-Bar-Squared	-.032916	
F-stat.	F(8, 8)	.93627[.536]
DW-statistic	2.4101	
Serial Correlation	1.5647[.211]	
Heteroscedasticity	6.6928[.010]	

Table 3. Regression results for Brazil

Dependent variable is TR		
17 obs from 1987 to 2003		
Regressor	Coefficient	T-Ratio[Prob]
C	.48132	1.4923[.170]
ΔFRP	-6.7887	-1.1171[.293]
ΔFX	.034207	.067322[.948]
ΔINF	-.0000	-.87081[.406]
ΔMINT	7.1707	.32691[.751]
ΔII	.11853	1.8061[.104]
ΔUSIR	-18.7815	-.76829[.462]
GDP	-.016450	-.12745[.901]
ΔQR	.078541	.13176[.898]
R-Bar-Squared	-.059040	
F-stat.	F(8, 9)	.88153[.565]
DW-statistic	2.3831	
Serial Correlation	CHSQ(1)=	.99241[.319]
Heteroscedasticity	CHSQ(1)=	.15643[.692]

Table 4. Regression results for Chile

Dependent variable is TR		
17 obs from 1987 to 2003		
Regressor	Coefficient	T-Ratio[Prob]
C	-.087634	-.33113[.750]
ΔFRP	4.1790	.26217[.801]
Δ2FX	.6728E-3	.11888[.909]
ΔINF	.029390	.61319[.559]
ΔMINT	-1.1792	-.31582[.761]
ΔII	-.025599	-.31087[.765]
ΔUSIR	30.6308	1.3101[.232]
GDP	.099969	1.2819[.241]
ΔQR	-0.06535	-.35517[.733]
R-Bar-Squared	-0.2064	
F-stat.	F(8, 7)	.69585[.700]
DW-statistic	1.3607	
Serial Correlation	CHSQ(1)=	.41345[.520]
Heteroscedasticity	CHSQ(1)=	6.1057[.013]

Table 5. Regression results for Colombia

Dependent variable is TR		
17 obs from 1987 to 2003		
Regressor	Coefficient	T-Ratio[Prob]
C	.60500	1.5775[.149]
ΔFP	15.8604*	1.9643[.081]
ΔFX	-.0016201	-1.3729[.203]
ΔINF	.013804	.27325[.791]
ΔMINT	-9.3261	-.96232[.361]
ΔII	.016902	.28810[.780]
GDP	.096185	1.5059[.166]
ΔUSIR	31.9856	1.3984[.196]
ΔQR	-.54033	-1.4584[.179]
R-Bar-Squared	0.45036	
F-stat.	F(8, 9)	2.7412[.077]
DW-statistic	1.5125	
Serial Correlation	CHSQ(1)=	1.1924[.275]
Heteroscedasticity	CHSQ(1)=	2.6029[.107]

Table 6. Regression results for Mexico

Dependent variable is TR		
18 obs from 1986 to 2003		
Regressor	Coefficient	T-Ratio[Prob]
C	.26009	.79656[.446]
ΔFRP	6.8010	1.4525[.180]
ΔFX	-.0055118	-.018528[.986]
ΔINF	-.0052792	-.92730[.378]
ΔMINT	-.95366	-.19697[.848]
ΔII	.043167	.80773[.440]
GDP	.050008	.70527[.498]
ΔUSIR	4.4114	.23493[.820]
ΔQR	.021550	.085379[.934]
R-Bar-Squared	-.049285	
F-stat.	F(8, 9)	.90019[.554]
DW-statistic	1.8845	
Serial Correlation	CHSQ(1)=	.099732[.752]
Heteroscedasticity	CHSQ(1)=	.059955[.807]

Table 7. Regression results for Venezuela

Dependent variable is TR		
18 obs from 1986 to 2003		
venezuela		
Regressor	Coefficient	T-Ratio[Prob]
C	.72911	.48308[.641]
FRP	-7.2567	-1.1318[.287]
ΔFX	.0045704	1.4795[.173]
ΔINF	.047638	2.0287[.073]
ΔMINT	-17.5965	-1.8198[.102]
ΔII	.21752	1.2996[.226]
GDP	.20668	1.8512[.097]
ΔUSIR	57.2841	1.3336[.215]
QR	.36232	1.1355[.286]
R-Bar-Squared	.22866	
F-stat.	F(8, 9)	1.6299[.241]
DW-statistic	1.9385	
Serial Correlation	CHSQ(1)=	.0051692[.943]
Heteroscedasticity	CHSQ(1)=	16.9132[.000]

Table 8. Regressioo results for Indonesia

Dependent variable is TR		
12 obs from 1992 to 2003		
Regressor	Coefficient	T-Ratio[Prob]
C	-.43089	-.20706[.843]
ΔFP	.69961	.043256[.967]
ΔFX	.2245E-3	.31313[.765]
INF	.0095296	.10586[.919]
ΔMINT	.71901	.16995[.871]
ΔII	.087344	.42534[.685]
GDP	.11819	.48552[.645]
ΔUSIR	52.6037	1.1469[.295]
ΔQR	2.8171	.52316[.620]
R-Bar-Squared	-.17501	
F-stat.	F(8, 6)	.73934[.663]
DW-statistic	1.0575	
Serial Correlation	CHSQ(1)=	.080155[.777]
Heteroscedasticity	CHSQ(1)=	.087273[.768]

Table 9. Regressioo results for Malaysia

Dependent variable is TR		
18 obs from 1986 to 2003		
Regressor	Coefficient	T-Ratio[Prob]
C	.12089	.57108[.582]
ΔFP	28.4931	1.4193[.190]
ΔFX	-.0030660	-.020611[.984]
ΔINF	-.076331	-1.1795[.268]
ΔMINT	.46643	.57204[.581]
ΔII	.029077	1.2476[.244]
GDP	.010086	.39766[.700]
ΔUSIR	25.5339*	1.9968[.077]
ΔQR	-.055422	-.63824[.539]
R-Bar-Squared	.43827	
F-stat.	F(8, 9)	2.6580[.083]
DW-statistic	2.1080	
Serial Correlation	CHSQ(1)=	.16890[.681]
Heteroscedasticity	CHSQ(1)=	.97505[.323]

Table 10. Regression results for the Philippines

Dependent variable is TR		
18 obs from 1986 to 2003		
Regressor	Coefficient	T-Ratio[Prob]
C	3.8977**	3.2009[.011]
ΔFRP	65.9324*	2.1723[.058]
ΔFX	-.41512**	-2.7614[.022]
INF	-.12782*	-2.0664[.069]
ΔMINT	3.6876	.48480[.639]
ΔII	-.069705	-.42304[.682]
GDP	-.17343	-1.3123[.222]
ΔUSIR	173.9621*	2.7477[.023]
ΔQR	-1.0041	-.89116[.396]
R-Bar-Squared	.36197	
F-stat.	F(8, 9)	2.2056[.130]
DW-statistic	1.8892	
Serial Correlation	CHSQ(1)=	.061408[.804]
Heteroscedasticity	CHSQ(1)=	10.7591[.001]

Table 11. Regression results for Thailand

Dependent variable is TR		
17 obs from 1987 to 2003		
Regressor	Coefficient	T-Ratio[Prob]
C	.43566	2.7119[.024]
ΔFRP	12.1658	.98925[.348]
ΔFX	-.054347	-1.1467[.281]
ΔINF	-.8906E-3	-.00840[.993]
ΔMINT	.96738	.43330[.675]
ΔII	.078366	1.9576[.082]
ΔGDP	.012022	.23690[.818]
ΔUSIR	36.8722	1.8809[.093]
ΔQR	-.33898	-1.1265[.289]
R-Bar-Squared	.50889	
F-stat.	F(8, 9)	3.2020[.051]
DW-statistic	2.2061	
Serial Correlation	CHSQ(1)=	.45611[.499]
Heteroscedasticity	CHSQ(1)=	.73048[.393]

APPENDIX VI

Country risk versus financial risk (annual data)

Argentina

Table 1.1 Country and financial risk in Argentina

Dependent variable is FRP		Dependent variable is TR		Dependent variable is TR	
16 obs from 1988 to 2003		16 obs from 1988 to 2003		16 obs from 1988 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	0.71097***	C	0.62989	C	0.013572
II	-0.0084625***	II	-0.018717	RESFRP	10.1857***
		RESFRP	9.1471**		
R-Bar-Squared	0.36556	R-Bar-Squared	0.43093	R-Bar-Squared	0.44816
DW-statistic	0.62538	DW-statistic	2.2996	DW-statistic	2.0216

Table 1.2. Country and financial risk in Argentina

Dependent variable is II		Dependent variable is TR		Dependent variable is TR	
16 obs from 1988 to 2003		16 obs from 1988 to 2003		16 obs from 1988 to 2003	
Regressor	Coefficient	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	50.9706***	C	-2.8573***	C	0.36142
FRP	-45.2904**	FRP	6.3673***	RESII	-0.0011898
		RESII	0.058691		
R-Bar-Squared	0.32607	R-Bar-Squared	0.43093	R-Bar-Squared	-0.071393
DW-statistic	0.40521	DW-statistic	2.2996	DW-statistic	2.5217

Mexico

Table 2.1 Country and financial risk in Mexico

Dependent variable is FRP		Dependent variable is TR		Dependent variable is TR	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	0.81225***	C	0.97031*	C	0.29034**
II	-0.012587***	II	-0.015789	RESFRP	-1.0723
		RESFRP	-1.0225		
R-Bar-Squared	0.85033	R-Bar-Squared	2.17E-04	R-Bar-Squared	-0.049319
DW-statistic	0.63154	DW-statistic	2.7792	DW-statistic	2.3899

Table 2.2 Country and financial risk in Mexico

Dependent variable is II		Dependent variable is TR		Dependent variable is TR	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	61.4660***	C	.039274	C	.28932**
FRP	-68.2155***	FRP	.93249	RESII	-.029306
		RESII	-.028659		
R-Bar-Squared	.85033	R-Bar-Squared	.2174E-3	R-Bar-Squared	-.0083749
DW-statistic	.62820	DW-statistic	2.7792	DW-statistic	2.6177

Brazil

Table 3.1. Country and financial risk in Brazil

Dependent variable is FRP(-1)		Dependent variable is TR		Dependent variable is TR	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	0.60015***	C	1.8345*	C	0.24947
II(-1)	-0.011032**	II(-1)	-0.047062*	RESFRP	1.5399
		RESFRP	1.6345		
R-Bar-Squared	0.24982	R-Bar-Squared	0.1127	R-Bar-Squared	-0.011116
DW-statistic	0.50538	DW-statistic	2.9145	DW-statistic	2.6074

Table 3.2. Country and financial risk in Brazil

Dependent variable is II		Dependent variable is TR		Dependent variable is TR	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	39.8205***	C	-0.30246	C	0.26397
FRP	-26.4233**	FRP(-1)	2.4016*	RESII(-1)	-0.030812
		RESII(-1)	-0.029030		
R-Bar-Squared	0.24982	R-Bar-Squared	0.1127	R-Bar-Squared	-0.0079706
DW-statistic	0.48001	DW-statistic	2.9145	DW-statistic	2.711

Chile

Table 4.1 Country and financial risk in Chile

Dependent variable is FRP(-1)		Dependent variable is TR		Dependent variable is TR	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	0.40384***	C	1.3015***	C	0.29920***
II	-0.0042892***	II	-.019774***	RESFRP	10.4820
		RESFRP	10.4820*		
R-Bar-Squared	0.94921	R-Bar-Squared	0.50616	R-Bar-Squared	0.061028
DW-statistic	1.5214	DW-statistic	2.7324	DW-statistic	1.3492

Table 4.2. Country and financial risk in Chile

Dependent variable is II		Dependent variable is TR		Dependent variable is TR	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	92.0751***	C	-0.61258**	C	0.29920**
FRP(-1)	-221.9969***	FRP(-1)	4.8908***	RESII	0.025186
		RESII	0.025186		
R-Bar-Squared	0.94921	R-Bar-Squared	0.50616	R-Bar-Squared	-0.025589
DW-statistic	1.4964	DW-statistic	2.7324	DW-statistic	1.3337

Colombia

Table 5.1 Country and financial risk in Colombia

Dependent variable is FRP(-1)		Dependent variable is TR		Dependent variable is TR	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	0.81898***	C	2.9748**	C	0.28437*
II(-1)	-0.012622***	II(-1)	-0.065773**	RESFRP	4.9412[.213]
		RESFRP	4.9412[.174]		
R-Bar-Squared	0.63696	R-Bar-Squared	0.2056	R-Bar-Squared	0.038605
DW-statistic	0.75537	DW-statistic	2.2282	DW-statistic	1.7514

Table 5.2 Country and financial risk in Colombia

Dependent variable is II(-1)		Dependent variable is TR		Dependent variable is TR	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	56.6916***	C	-1.2649*	C	0.28437*
FRP(-1)	-52.1566***	FRP(-1)	5.1188**	RESII	-0.0034045
		RESII	-0.0034045		
R-Bar-Squared	0.63696	R-Bar-Squared	0.2056	R-Bar-Squared	-0.062302
DW-statistic	0.85286	DW-statistic	2.2282	DW-statistic	1.6627

Venezuela

Table 6.1. Country and financial risk in Venezuela

Dependent variable is FRP(-2)		Dependent variable is TR		Dependent variable is TR	
16 obs from 1988 to 2003		16 obs from 1988 to 2003		16 obs from 1988 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	-0.26078	C	11.0906**	C	0.39921
II(-2)	0.0072781	II(-2)	-0.30319**	RESFRP	-10.2158**
		RESFRP	-10.2158**		
R-Bar-Squared	-0.016548	R-Bar-Squared	0.40085	R-Bar-Squared	0.19998
DW-statistic	2.2333	DW-statistic	1.6536	DW-statistic	1.4336

Table 6.2 Country and financial risk in Venezuela

Dependent variable is II(-2)		Dependent variable is TR		Dependent variable is TR	
16 obs from 1988 to 2003		16 obs from 1988 to 2003		16 obs from 1988 to 2003	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	35.2916***	C	0.35030	C	.39921
FRP(-2)	7.0379	FRP(-2)	-11.8264***	RESII	-.22884
		RESII	-.22884		
R-Bar-Squared	-0.016548	R-Bar-Squared	0.40085	R-Bar-Squared	0.060273
DW-statistic	1.3381	DW-statistic	1.6536	DW-statistic	2.3458

Indonesia

Table 7.1 Country and financial risk in Indonesia

Dependent variable is FRP(-2)		**Dependent variable is TR**		**Dependent variable is TR**	
15 obs from 1989 to 2003		15 obs from 1989 to 2003		15 obs from 1989 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	0.11031**	C	-0.29425	C	0.27955
II	0.7463E-3	II	0.014080	RESFRP	10.4610**
		RESFRP	10.4945*		
R-Bar-Squared	-0.023961	R-Bar-Squared	0.19263	R-Bar-Squared	0.2073
DW-statistic	0.85053	DW-statistic	1.4531	DW-statistic	1.4338

Table 7.2. Country and financial risk in Indonesia

Dependent variable is II		**Dependent variable is TR**		**Dependent variable is TR**	
15 obs from 1989 to 2003		15 obs from 1989 to 2003		15 obs from 1989 to 2003	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	32.0091**	C	-1.2519*	C	0.25227
FRP(-2)	63.3583	FRP(-2)	10.8903**	RESII	0.0062475
		RESII	0.0062475		
R-Bar-Squared	-0.027763	R-Bar-Squared	0.19263	R-Bar-Squared	-0.068009
DW-statistic	0.22248	DW-statistic	1.4531	DW-statistic	1.2987

Malaysia

Table 8.1 Country and financial risk in Malaysia

Dependent variable is FRP		**Dependent variable is TR**		**Dependent variable is TR**	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	0.018610	C	-0.96076	C	0.094993
II	-0.2714E-3	II	0.017385	RESFRP	-7.9719
		RESFRP	-7.8702		
R-Bar-Squared	0.025519	R-Bar-Squared	-0.052684	R-Bar-Squared	-0.050736
DW-statistic	1.0806	DW-statistic	2.3575	DW-statistic	2.2769

Table 8.2 Country and financial risk in Malaysia

Dependent variable is II		**Dependent variable is TR**		**Dependent variable is TR**	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]	Regressor	Coefficient[Prob]
C	61.5359***	C	0.12409	C	0.098180
FRP	-293.5456	FRP	-12.3466	RESII	0.015207
		RESII	.015249		
R-Bar-Squared	0.025519	R-Bar-Squared	-0.052684	R-Bar-Squared	-0.01757
DW-statistic	0.69206	DW-statistic	2.3575	DW-statistic	2.3485

The Philippines

Table 9.1 Country and financial risk in Philippines

Dependent variable is FRP(-1)		Dependent variable is TR		Dependent variable is TR	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	0.24875***	C	2.0135**	C	0.34608
II(-1)	-0.0040078***	II(-1)	-0.050266**	RESFRP	11.4471[.294]
		RESFRP	11.4471[.232]		
R-Bar-Squared	0.75124	R-Bar-Squared	0.24942	R-Bar-Squared	0.010331
DW-statistic	1.4041	DW-statistic	2.3798	DW-statistic	1.7643

Table 9.2 Country and financial risk in Philippines

Dependent variable is II(-1)		Dependent variable is TR		Dependent variable is TR	
18 obs from 1986 to 2003		18 obs from 1986 to 2003		18 obs from 1986 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	55.3026***	C	-1.0767*	C	0.34608
FRP(-1)	-191.0972***	FRP(-1)	12.2857**	RESII	-0.0043884
		RESII	-0.0043884		
R-Bar-Squared	0.75124	R-Bar-Squared	0.24942	R-Bar-Squared	-0.06199
DW-statistic	1.224	DW-statistic	2.3798	DW-statistic	1.808

Thailand

Table 10.1 Country and financial risk in Thailand

Dependent variable is FRP(-2)		Dependent variable is TR		Dependent variable is TR	
17 obs from 1987 to 2003		17 obs from 1987 to 2003		17 obs from 1987 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	0.012205	C	-1.3019	C	0.19373
II	0.2906E-3	II	0.026248	RESFRP	7.0974*
		RESFRP	7.0974*		
R-Bar-Squared	-0.063529	R-Bar-Squared	0.16287	R-Bar-Squared	0.1264
DW-statistic	0.4539	DW-statistic	2.1622	DW-statistic	2.0867

Table 10.2 Country and financial risk in Thailand

Dependent variable is II		Dependent variable is TR		Dependent variable is TR	
17 obs from 1987 to 2003		17 obs from 1987 to 2003		17 obs from 1987 to 2003	
Regressor	Coefficient	Regressor	Coefficient	Regressor	Coefficient
C	56.6912***	C	-0.017444	C	0.19373
FRP(-2)	10.1239	FRP(-2)	7.3423*	RESII	0.024186
		RESII	0.024186		
R-Bar-Squared	-0.063529	R-Bar-Squared	0.16287	R-Bar-Squared	0.011451
DW-statistic	0.46884	DW-statistic	2.1622	DW-statistic	1.7498